# Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

AUGUST, 1960

Engineering – Operating – Maintenance
A Special Reference Section

## PAINTS AND PROTECTIVE COATINGS

- - - P. 25-32

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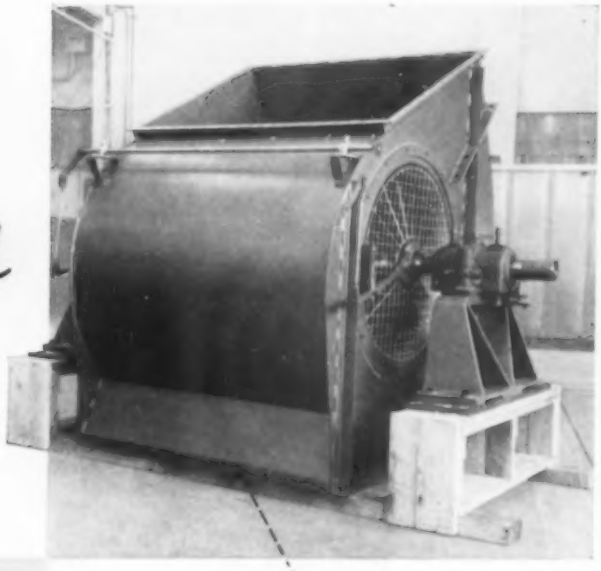
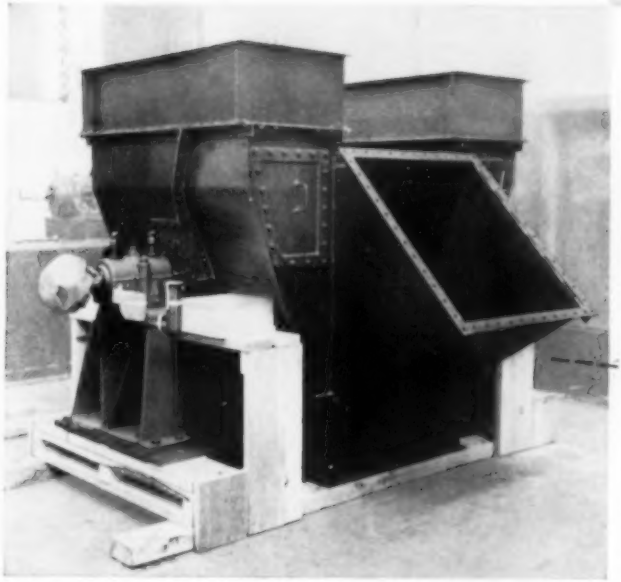
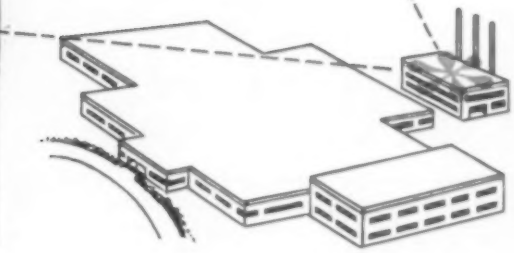
Volume 78 Number 8

# Headed for another tough job





***...this mechanical draft "team" of top performers from CLARAGE***



**FOR FORCED DRAFT... FOR INDUCED DRAFT... AGAIN CLARAGE QUALITY IS THE CHOICE!** These Clarage units, pictured on the shipping dock, will soon be in service at one of the nation's leading paper mills.

At the top is the Clarage Type AF Dynafoil forced draft fan with airfoil blades and Vortex Controls at the inlets; below is the Clarage Type DN Dynacurve induced draft fan with 36 forward curved blades. Clarage equipment, such as this combination, has been selected for over 4,500 central stations and industrial power plants. These users know that with anything as vital as uninterrupted operation, it pays big dividends to get the best in equipment—Clarage.

For complete information, request Catalog 905 on the Type DN, Catalog 859 on the Type AF, and Catalog 901 on the Type RT induced draft fan.

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*Kalamazoo, Michigan*

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

# YOU CAN READ 'BUELL CYCLONES' AS '$AVING$'

**In recovering valuable dust, a slight increase in collection efficiency can amount to a significant savings in dollars. Buell cyclones provide this extra efficiency not found in ordinary cyclones. Only Buell cyclones have the unique design feature . . . the "Shave-Off", which provides this plus in efficiency, stops fine dust from escaping. Savings with Buell cyclones can be very significant. In the recovery of catalyst in a large cat cracker in oil refining, for instance, 1/10 of 1% increase in efficiency results in *daily savings of $17,000* (at $250 per ton). Even with lighter dust loadings savings can be surprisingly high. Start saving today by finding out more about the extra efficiency of Buell cyclone collectors. Literature is available or we'll be glad to study the savings possibilities in your dust collection problem. Contact Buell Engineering Company, Inc., 123 William St., New York 38, N. Y. Northern Blower Div., 6404 Barberton Ave., Cleveland, Ohio. (Subsidiary: Ambuco Limited, London, England).**

**In an ordinary cyclone dust re-circulates in the double-eddy currents at the top, finer dust escapes. The result is erosion of the walls of the cyclone and loss of efficiency. In the Buell cyclone (as shown in the cutaway illustration) the dust at the top makes *less* than one revolution before it is trapped by the "Shave-Off". It is then channeled down to the lower portion of the cyclone, well below the clean gas outlet. Result: longer life for the cyclones, plus higher collection efficiency.**

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# Southern Power & Industry

The Industrial and Power Journal of the South and Southwest



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## AUGUST, 1960



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# Facts and Trends

August 1960

◆ BUSINESS A TAX COLLECTOR—An item by William Feather in a weekly newspaper, the Union Bridge, Md., Pilot, said in part:

"During a wakeful hour in the night, I got an answer to why business has lost so much in public esteem in recent decades. The reason is that business has become a gigantic tax collector for the government. Business collects the employee's income tax, the social security payment, and the gasoline, tobacco, liquor, entertainment, sales, and all other excise taxes. On top of this, business collects its own profits tax by a necessary levy on consumers . . . Meanwhile, business (or capitalism, if you please) takes an undeserved beating. Without private enterprise, the economy would be sunk; yet enterprise is loaded with new, expensive and distasteful chores at every meeting of minds in Washington, state capitals, and city halls."

◆ ELECTRON BEAM WELDER—A new twelve-page catalog has just been released by Air Reduction Sales Company, Special Products Department, on its newest welding technique, electron beam welding.

This method, which welds by the direct bombardment of metal with highly accelerated electrons in a vacuum chamber, has special significance in regard to the newer metals and alloys which are difficult or impossible to weld with conventional techniques.

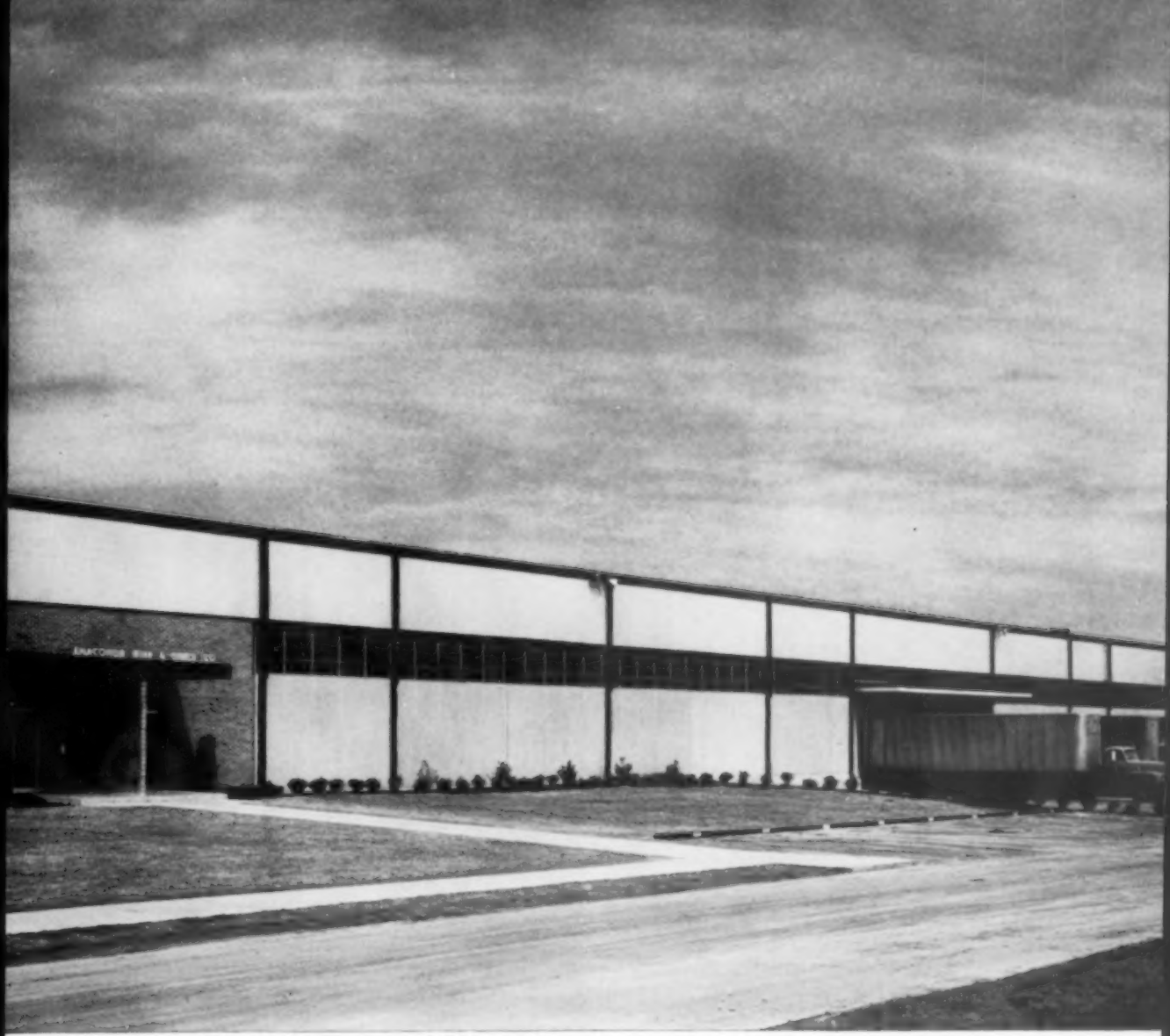
◆ SELECTIVE LOAD CENTERS—A two hundred per cent increase in orders over last year for Selectively Coordinated Load Center Unit Substations has been announced by General Electric Co. Thirty per cent of all load centers shipped by G. E. this year have been for the newer, more highly engineered substations.

The new "intelligent" load center provides a high degree of service continuity without sacrificing protection to other system components. This is accomplished by coordinating the tripping times of the main and feeder power circuit breakers to remove power only from the faulted feeder during short circuit conditions, and at the same time, allow power to flow continuously to unfaulted feeders.

◆ ELECTRONIC VEEPS—Use of electronic computers in several process industries is reaching the point where they can be expected soon to make some "vice-presidential decisions." That's what the general manager of Daystrom bravely told a conference of industrial executives at a recent American Management Association seminar.

"For example, a petroleum tank farm will contain a variety of crudes. Its operators know there's a market for a certain type of gasoline or kerosene. So, they ask the computer not only to handle control functions but to do the computations necessary to determine the plant's capabilities and capacities in different processes, such as platforming, gas concentration, tar removal and so on. They will soon be able to use the computer system to determine the best way to operate the plant—what fuels to pro-

(*Continued on page 8*)



# The modern wire and cable plant to serve the dynamic South

We have served the South for many years, and we have been proud to share in this region's unprecedented growth.

Now, this new Anaconda Wire & Cable Company plant will provide the way to even better service – thanks to its modern manufacturing and storage facilities and central location.

In fact, everything in this operation has been designed to give you wire and cable products of highest quality and deliver them to you FAST by truck or rail.

In addition, the complete research and engineering facilities and the varied manufacturing skills of the entire Anaconda Wire & Cable Company are available to – and stand behind – the new Watkinsville plant, an expression of Anaconda's pride to be part of the dynamic South.

**Anaconda Wire & Cable Company**
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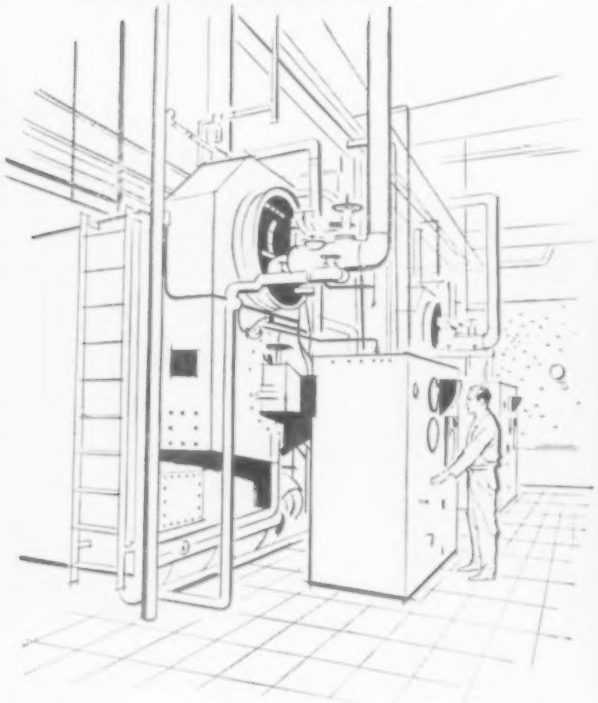
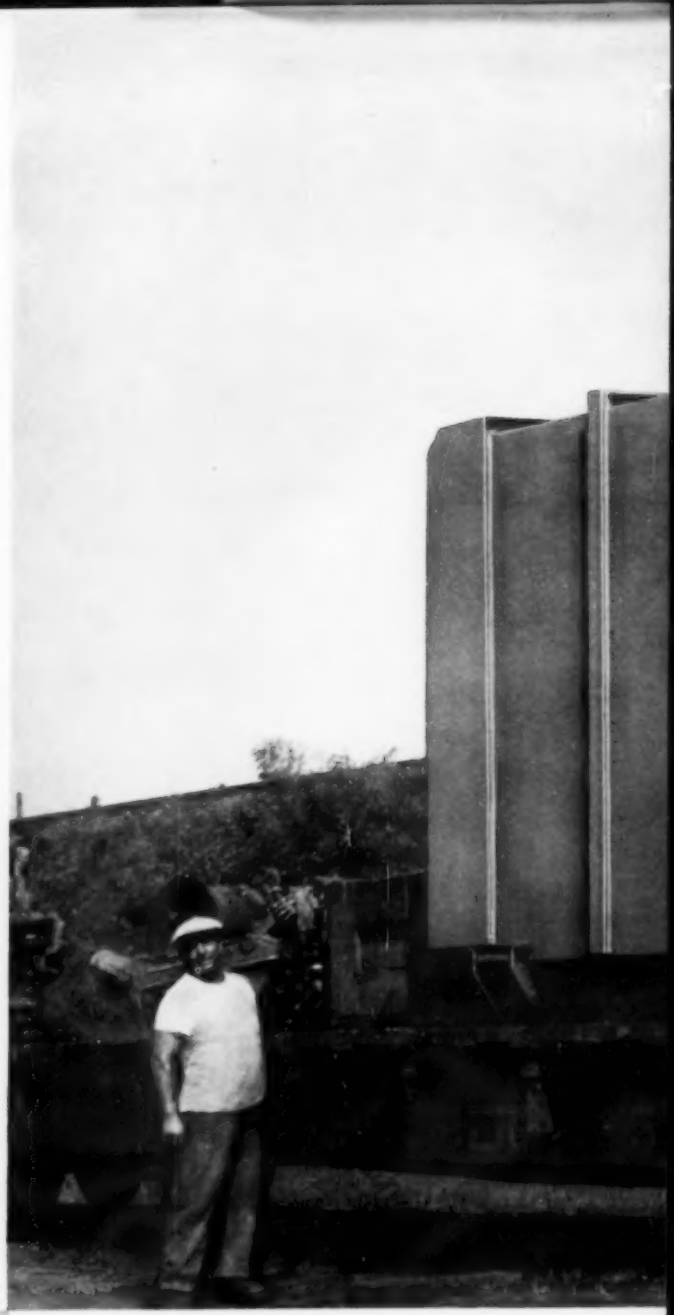
SEE THE MAN FROM

**ANACONDA®**

FOR ELECTRICAL WIRE AND CABLE

# First B&W Shop-Assembled Boiler Ever Built Starts Life #2 South of The Border...

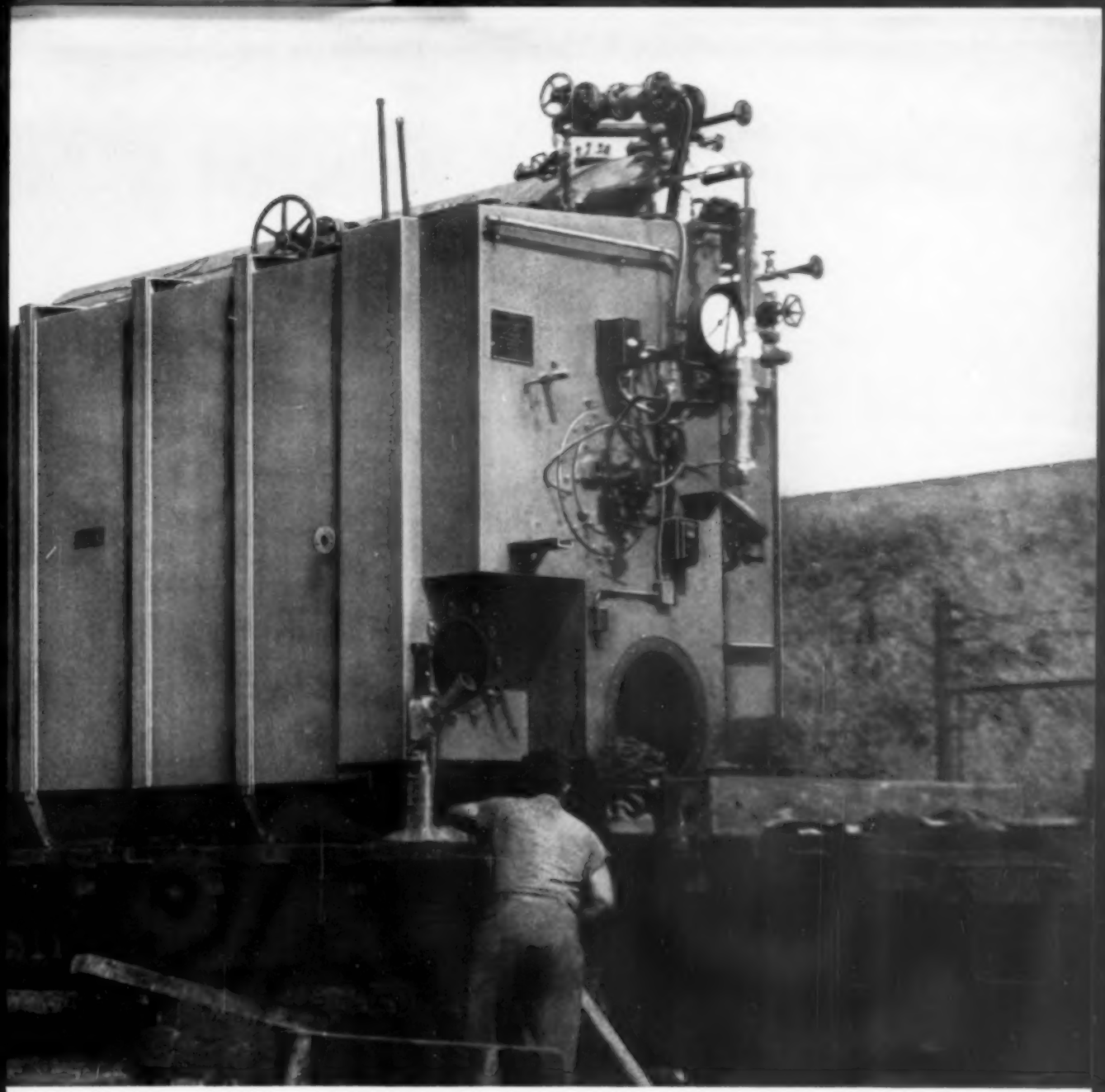




**Number 1 of Nearly 1,000 Similar Units Meets Expanding Steam Requirements of Mexican Textile Firm**

A decade ago, a major cleaning and laundering concern in Staten Island, N. Y., needed a dependable supply of steam for their massive laundering operation. In filling that need, B&W designed and delivered its first shop-assembled boiler. Operating at 165 psi and 358 F, this oil-fired package boiler served the company to perfection with 20,000 lb of clean, dry steam per hour.

The Staten Island firm had continuing success with this new departure in boiler design and in less than two years, the unit had paid for itself. The recent advent of the automatic washer and dryer, however, has so changed the laundry business that the firm now finds itself predominantly a dry-



cleaning establishment. Having no further need for a unit as large as the FM-type boiler, the original owner recently sold it (at a good percentage of its original cost) to another B&W customer, the Textiles y Acabades Company of Mexico. Today, the boiler continues its fine record, generating heat and process steam for the Mexican textile firm.

Indicative of the *built-in* durability of B&W units, the "times and travels of FM-1" are further evidence in action of dependable steam generation by B&W. Whatever *your* steam requirement . . . whatever your most economical fuel, B&W has the boiler best suited to your application. Your local B&W representative has all the facts on your area. Call him soon. The Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.

B&W — THE NATION'S LEADING MANUFACTURER OF INDUSTRIAL BOILERS

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B&W

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BOILER DIVISION

## Facts and Trends (Continued)

duce and in what quantities, taking into consideration present prices, transportation costs, and other elements that go into vice-presidential decisions."

◆ ENGINEERING ENROLLMENT—There may be too much hoop-la about the "tragic decrease" in college enrollment in engineering. First of all, definitions of engineering are not well established. The borderline between engineering and science, and to some extent other courses, is not clear-cut.

There is some evidence that engineering's loss is science's gain insofar as enrollment is concerned. And furthermore smaller enrollment in engineering does not necessarily constitute a loss. The best engineering schools are tightening their requirements—and quite likely improved quality will offset the decrease in numbers. It must also be recognized that present day engineers and scientists are backed up by greater numbers of technicians and helpers than in the past. It is quite possible that a few top quality engineers may do more and better work than if hoards were graduated under less than top scholastic standards.

◆ CORROSION RESISTANCE—Aluminum Company of America reports development of a new group of aluminum alloys that display amazing resistance to corrosive attack.

Unique aluminum-iron-nickel alloys, formulated by Alcoa Research Laboratories, can withstand the sharply deteriorating effect of high purity water at temperatures up to nearly 700 F. In addition to conventional applications, the new compositions hold promise as cladding for uranium fuel rods in today's radically designed, more powerful atomic reactors.

◆ BOOKLESS LIBRARY—An electronic "library," sans books, within five years was predicted at the AIEE summer meeting. The bookless library's heart will be an electronic computer, according to two G. E. engineers.

"It will, within a few years, be perfectly feasible to carry extremely large libraries of information in on-line digital computer storage. Physical storage and handling of books and documents in such a library will rarely occur. Automatic page readers; automatic information indexing by the computer; cheap, bulk, random access memory; high-speed electronic printing—all of these will be available in less than five years."

◆ OWNERSHIP OF SUBSTATIONS—An increasing trend toward private ownership of primary substations serving industry—especially lower voltage units—was noted at the Summer General Meeting of the American Institute of Electrical Engineers. The subject was discussed by C. C. Saunders of E. I. du Pont de Nemours & Co.

One major factor in the final decision as to substation ownership seems to be in regard to maintenance. Substations of under 2,000 kva probably would utilize comparatively low voltage power and could be serviced by plant personnel without waiting for utility repairmen in case of trouble. Higher kva ratings, on the other hand, would present service problems the utility could handle better than plant personnel, Mr. Saunders said.

◆ FOR BETTER OR WORSE—The president of the American Society of Civil Engineers called upon its 45,000 members to set a truly profes-

(*Continued on page* 10)


Now, all Spang CW Galvanized Steel Pipe carries this new marking which is your assurance of top-quality domestic steel pipe.

# Look for this marking when you buy steel pipe

**It spells two important advantages for you:**

**1.** Pipe made in the United States of America must meet the high product standards set by definite technical specifications established for all pipe manufacturers. When you buy American-made steel pipe, you know you're getting a fine, standard product with good working characteristics and assured long life that will meet specified service requirements.

**2.** The Spang CW Steel Pipe marking indicates that extra measure of quality. When you buy Spang, you know you're getting a product that's carefully controlled during manufacturing and thoroughly tested and inspected before shipping to assure you of a top-quality product, uniform throughout, for fast, economical, trouble-free installations.

Don't take chances by making second-rate installations with questionable foreign imports. It's worth your reputation to buy Steel Pipe made in USA. It pays in the long run!

Look for this Spang marking on your next pipe order. You can't buy a better pipe! Your local Spang Distributor can give you top-quality service. Give him a call!

Steel's Symbol of strength, long life, and economy

New "Made in USA" marking on Spang CW Galvanized Steel Pipe is applied after pipe has been quick-quenched following galvanizing.

SPANG CW STEEL PIPE

**THE NATIONAL SUPPLY COMPANY**

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Subsidiary of Armco Steel Corporation

sional example in dispelling a growing disregard for honesty and fair dealing in business relations.

Frank A. Marston said in his president's address at the annual ASCE convention that the civil engineer must not only be competent in his technique, but he must conform to the general requirements for professional behavior. "Today there appears to be a growing disregard for honesty and fair dealing in business relations, in TV shows, in some labor union managements, in competition for engineering projects, and in other phases of everyday life. This is to be regretted greatly if it applies to a member of the engineering profession."

◆ SILICONE INSULATION—Six years of successful use of hundreds of silicone insulated totally enclosed non-ventilated direct current electric motors was reportd at the Summer General Meeting of the American Institute of Electrical Engineers, by U. M. Elder of Westinghouse.

Silicone as an insulation has been investigated since 1939. Early use in non-ventilated motors resulted in excessive brush wear. This led to efforts to develop silicone resins that would not affect brush wear, to develop brushes that would overcome the silicone effect, and to develop a mechanical means of eliminating the cause of brush wear. Silicone insulated totally enclosed direct current machines are being successfully manufactured and applied today because these requirements have been met.

◆ ANOTHER NEW POWER SOURCE—Free radicals—molecular fragments which are known to possess very high energy potentials during their normally fleeting existence, and which have long been considered by scientists to be the "master key to understanding what makes the chemistry of the universe go"—were recently revealed as a promising new source of useful power.

In experiments, the newly formed Energy Conversion Laboratories claims that constant streams of these highly reactive particles are being produced by various means in a safe, simple and seemingly self-sustaining system. Their natural atomic reactions are being controlled at near room temperature. And their hitherto unharnessed burst of chemical energy is being converted directly into electricity and other forms of power.

◆ REPRINTS AVAILABLE—Write the editors of SPI for small quantities of the following at no charge:

HOW EPOXY CAN SERVE YOU—Two maintenance engineers of Dow Chemical Company's Texas Division. 4 pages. Tells exactly how 10 separate repair jobs were handled and describes several epoxy mixes that are good for maintenance jobs.

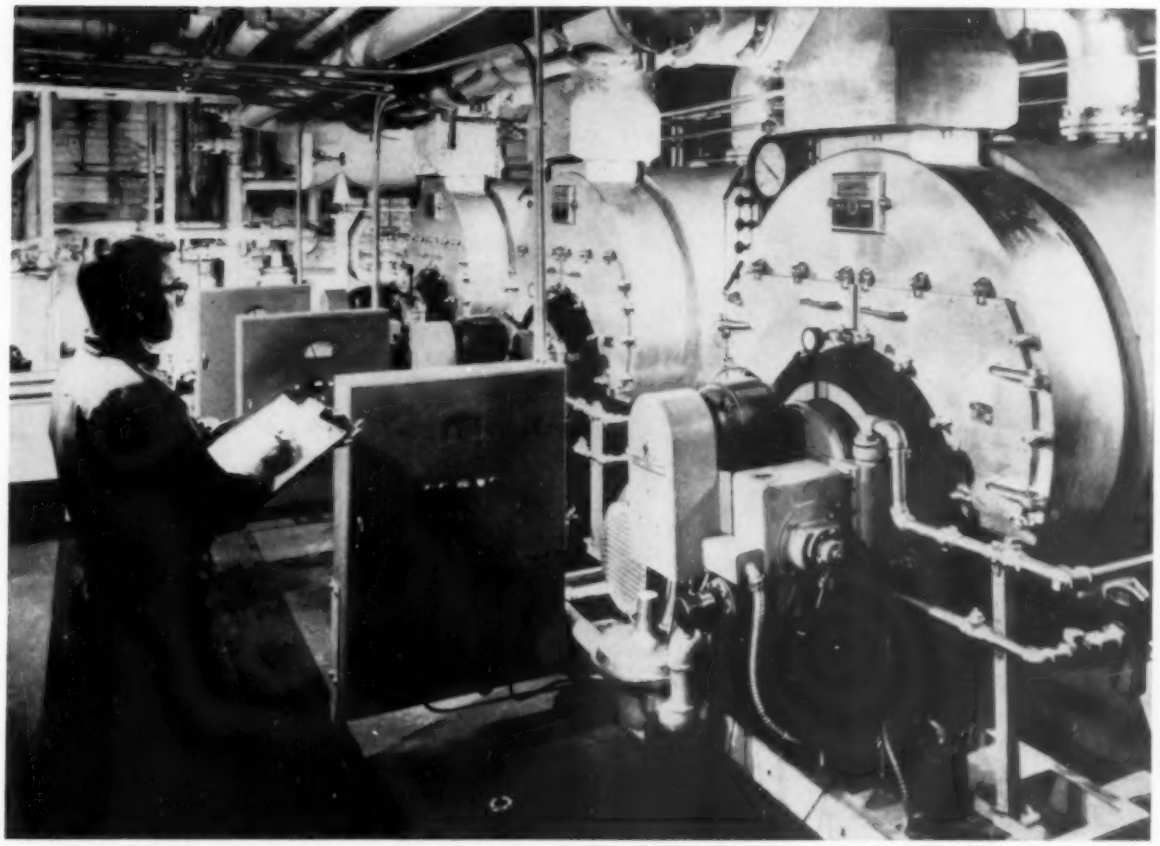
ORIFICE METER INSTALLATIONS—By W. H. Matthews, Supervisor of Instrument & Electrical Design, Chemstrand Corp., Pensacola, Fla. 8 pages. Tells what the plant man needs to know about installation to get accurate, dependable service.

INSPECTION REPORTS—By S. L. Terry, Southwestern Public Service Co. 8 pages. Last call on this one, the supply is running low. Tells how the station chemist can maintain information on the condition of boilers, cooling towers, condensers, heat exchangers, tanks and softeners. Actual inspection sheets are presented.

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 8, Ga.

# The smart way to modernize

*. . . specify your heating plant in one package*



This remodeled boiler room serves the two buildings of the Columbus Dispatch newspaper plant, Columbus, Ohio. Fuels can be quickly changed in these three Iron Fireman-Kewanee gas-oil boiler-burner units. Consulting Engineers, John Paul Jones, Cary & Millar, Cleveland; Architect, Dan A. Carmichael, Columbus; Heating Contractor, Limbach Co., Columbus.

## Iron Fireman burner with boiler — engineered as a single unit

These famous boiler-burner units are the products of two great specialists—each in its own field. They are engineered for each other. Included in one catalog, they can be ordered by a single model number from one set of specifications.

### Plenty of reserve power

You can feel *safe* in specifying Iron Fireman equipment. These thoroughly engineered units are conservatively rated. The normal firing rate is a comfortable cruising speed—less strain, low maintenance, quiet operation, higher efficiency —and that big extra capacity is always standing by to pick up extra loads.

### Compact and complete

These complete steam or hot water generating units require little more than service connections. Automatic controls, air and fuel systems are built in. No special boiler settings; low headroom; no high stack.

*Please mail coupon for catalog and specifications.*

**IRON FIREMAN**®

AUTOMATIC FIRING EQUIPMENT
FOR OIL, GAS, COAL

IRON FIREMAN MANUFACTURING CO.
3062 West 106th Street, Cleveland 11, Ohio
(In Canada, 80 Ward Street, Toronto, Ontario)

Please send catalog and specifications on following equipment:

☐ Complete boiler-burner units
☐ Forced draft firing unit only

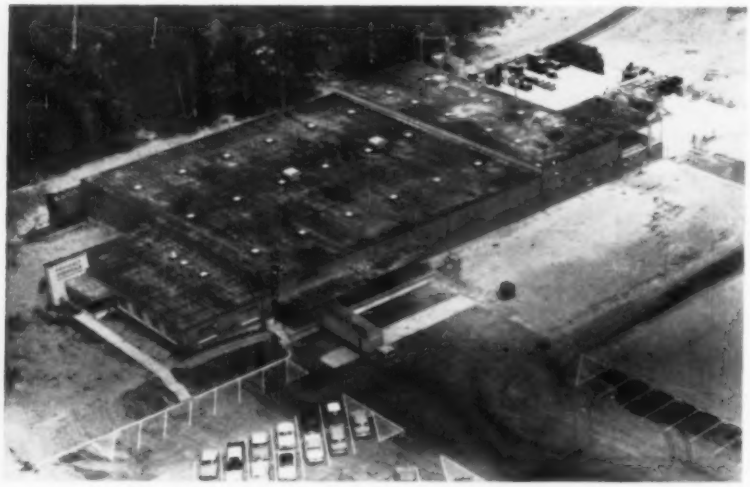
Name_____
Firm_____
Address_____
City_____ State_____



For more information, use Reply Card—Page 81

# the SOUTH—SOUTHWEST

*more power . . . more plants . . . more money*



## Pennsalt's New Georgia Plant in Operation

Production and distribution of a diversified line of chemical specialties are under way at **Pennsalt Chemicals Corp.'s** 34,000 sq ft plant recently completed on a 10-acre site in College Park, Georgia, on the Southern perimeter of Atlanta.

The modern plant layout includes both interior and exterior materials storage and manufacturing facilities. Exterior explosion-proof production equipment will make such products as Delchem cleaners and coatings for the aircraft industry. The interior production area features a large mezzanine equipped with the latest machinery for wet and dry blending, and utilizes efficient gravity feeds for packaging. This feature makes possible single floor operation and closer contact between production, administration, and shipping.

Timothy McCarthy, Inc., Atlanta, was general contractor for construction, using designs prepared by Pennsalt engineers, with provision made for future expansion. Robert F. Ragsdale, Pennsalt's area manager, will be responsible for all phases of the new plant's operation.

## H. K. Porter Expands Alabama Facilities

**H. K. Porter Company, Inc.,** announced the start of a construction and equipment modernization program at the Bessemer, Alabama plant of its Refractories Division.

Almost $2 million is being spent at the Bessemer Works, where plans call for a new factory building and storage facilities, a tunnel kiln, dryers, and new brick-making facilities. These additional facilities will make possible a marked increase in the capacity of Bessemer Works to produce ladle brick, and enable this facility to produce added lines of fire clay refractories.

## Cement Plant — N. C.

**Ideal Cement Company** announced plans to build a $15,000,000 cement plant at Wilmington, North Carolina. The plant will have an annual productive capacity of 1.5 million barrels.

Ideal also will have a distribuiton facility at Fayetteville, North Carolina. Plans call for the cement to be manufactured at Wilmington from marl mined in Pender County and adjoining counties and a portion of the finished product to be barged up the Cape Fear River to Fayetteville for distribution.

Ideal recently acquired, as a subsidiary, the Volunteer Portland Cement Company, Knoxville, Tennessee. Volunteer has long sold cement in North Carolina and had acquired excellent deposits of raw materials after having carried on an extensive program of geological exploration in the state.

Engineering and construction on the early phases of the plant are expected to get under way by the end of this year. Provisions will be made to quickly and economically increase the plant capacity when necessary. It will probably be 1962 before manufacturing can be started.

## Diamond Alkali Expands West Virginia Plant

Plans to initiate a long-range expansion program at the Belle, West Virginia, plant of the Chlorinated Products Division of **Diamond Alkali Company,** Cleveland, Ohio, have been announced by L. P. Scoville, Division General Manager.

Work will include erection of new buildings and the replacement of operating equipment to take advantage of recent process improvements. Modernization of facilities for the production of methyl chloride, methylene chloride, and chloroform will follow.

## Steel Mill for Miami

Plans for a $4 million steel mill in Dade County were disclosed recently by a New York firm and John D. MacArthur, local housing developer. C. Marshall Wood, investment counselor and president of **Sovereign Resources Incorporated,** of New York, said the plant would be located somewhere in the North Miami area.

The mill would produce from 75,000 to 90,000 net tons of reinforcing bars and merchant shapes annually, much of which would find its way into Dade County's building program.

The firm is constructing another steel mill at Palestine, Texas, which was announced in the July issue of S.P.I. Eventually, ingots from that mill will feed the furnace of the Dade plant, where completion date is set for no later than April, 1961.

# Dixie Bearings recommended a better seal, a better bearing and savings are $700.00 a year!

Here's a maintenance foreman who knew where to get help when bearings in his care failed prematurely. He called a Dixie Bearings engineer when the bearings in this bucket elevator conveyor failed after only two weeks of use.

The Dixie Bearings engineer found that the powdered zinc transmitted by the conveyor was responsible for the failure. Powdered zinc had worked through the bearing seal and since zinc joins itself when rubbed between two surfaces, being rubbed between the balls and bearing race led to a build-up that stopped the bearings in their tracks.

Analysis of loads and speeds showed a less expensive bearing would work well if its seal would shut out all dirt. The original bearings cost $16.79 each — the replacement only $7.36! This meant a net saving of $700 in bearing costs alone. Now in operation for two years the bearings have been replaced only once.

Dixie Bearings, Inc. sales engineers sell only products we are authorized to sell. No deals, no "just as good as" substitutes. Call the branch nearest you — The bearings you want are in stock ready for delivery.

*Providing bearing service in the South*

**DIXIE BEARINGS, INC.**

**ARKANSAS:** Little Rock • **FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge New Orleans • **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville Memphis • Nashville • **VIRGINIA:** Norfolk • Richmond • Roanoke

# *News of the South-Southwest — more power . . . more plants . . . more money*

Scale model of a new Goodyear Tire & Rubber Company plant in Texas is examined by Russell DeYoung, company president, and Sam DuPree, vice-president in charge of production.

## Goodyear Plant — Texas

Two new synthetic rubbers will be produced in a new, multi-million dollar plant to be constructed near Beaumont, Tex., by the **Goodyear Tire & Rubber Company.**

The new products will be Natsyn, made from isoprene, and Budene, made from butadiene, both derivatives of petroleum. They will be used in tires and in industrial products such as conveyor belts. The new synthetics are said to outperform natural rubber in many applications.

To date, Budene and Natsyn have been produced in limited quantities in pilot plants at Akron. The Beaumont plant will be the company's first production operation engineered for commercial output.

In addition to helping meet Goodyear's need for additional types of rubber, the new Texas facility will produce synthetic rubber for sale to others. The Houston plant, located just 90 miles from the new site, produces Plioflex, a styrene-butadiene type rubber, as distinguished from the two new types to be made in Beaumont.

Goodyear's Beaumont plant will be located within several miles of Mobiloil Company's Beaumont refinery, from which Goodyear will obtain its principal raw materials. The initial installation will cover a relatively small portion of the site, leaving ample room for expansion of rubber production facilities and for other chemical activities in line with availability of other raw materials in the area. Production is expected to begin in about one year.

## CP&L Plant on Line

A flick of a switch near Hartsville, S. C., recently put the Palmetto State's newest electric power source on the line.

The start-up went without a hitch as **Carolina Power & Light Company** technicians eased a 250,000-horsepower steam-electric generator into harness for a period of operational tests leading to full-scale production.

A two-year construction deadline had been set when ground was broken May 30, 1958. The plant, whose boiler structure juts 16 stories into the sky, is flanked by a 2,300-acre cooling lake formed by Black Creek. The lake stretches more than seven miles northward into Chesterfield County behind a dam 5,000 feet long. In full operation, the plant will draw 150,000,000 gallons of water daily from the lake, use it for cooling purposes and then return it to the lake via a discharge canal a mile upstream.

Rail spurs bisect the plant grounds. Over these lines will move up to 6,000 carloads of coal per year to feed the plant's initial generating unit. A coal storage area will accommodate up to 600,000 tons.

The initial unit is expected to be only the beginning for the Darlington County plant. The project is designed for eventual expansion to well over a million horsepower as power needs in the company's South Carolina service area continue to grow.

## Petrochemicals — Texas

A major joint venture in production and marketing of petrochemicals has been announced by **El Paso Natural Gas Company** and **Rexall Drug and Chemical Company.** It will include plants at Odessa, Texas, for the production of olefins, polyolefins and chemicals.

The first plants to be built are scheduled to begin production in early 1962 and will produce ethylene, propylene, conventional polyethylene, linear polyethylene and polypropylene. Initial capacity of the olefin plant will be in excess of 200,000,000 pounds per year and the combined capacity of the polyolefin plant will be in excess of 150,000,000 pounds per year. The El Paso Natural Gas Company will furnish the raw materials for the plants.

Ralph Knight, president of Rexall Chemical Company, will direct the polymer and chemical plant operation. John Provo, vice-president, will be in charge of production Dr. Michael Erchak, vice-president, will be in charge of Research and Development, and Blaine Kuist, vice-president, will be in charge of Engineering and Construction.

C. L. Perkins, president of El Paso Natural Gas Products Company, and C. L. Moore, vice-president, will be in charge of hydrocarbons and olefin producing plants.

## Generators Ordered for Appalachian Power Co.

Two 25,000 kva, 138.5 rpm hydraulic turbine driven generators, supplied by Elliott Company, have been ordered for installation at the Lower Development plant of the Smith Mountain project on the Roanoke River near Alta Vista, Virginia. Appalachian Power Company is undertaking the project, based on engineering designs of American Electric Power Service Corp. Both generators will feature outdoor enclosures and umbrella type construction. They will be driven by Baldwin fixed-blade turbines.

(*Continued on page* 18)

# Who Discovers the Discoverers?

*"A professor can never better distinguish himself in his work than by encouraging a clever pupil, for the true discoverers are among them, as comets amongst the stars."* CARL LINNAEUS

Somewhere in this mighty land of ours, a gifted youth is learning to see the light of tomorrow. Somewhere, in a college classroom or laboratory, a dedicated teacher is gently leading genius toward goals of lofty attainment. Somewhere the mind of a future discoverer–in science, engineering, government, or the arts–is being trained to transcend the commonplace.

Our nation has been richly rewarded by the quality of thought nurtured in our colleges and universities. The caliber of learning generated there has been responsible in no small part for our American way of life. To our college teachers, the selfless men and women who inspire our priceless human resources, we owe more than we will ever be able to repay.

*Yet how are we actually treating these dedicated people?* Today low salaries are not only driving gifted teachers into other fields, but are steadily reducing the number of qualified people who choose college teaching as a career. At the same time, classrooms are beginning to get overcrowded. In the face of this, college applications are expected to double by 1967.

This is a severe threat to our system of education, to our way of life, even to our very existence as a nation. Our colleges need help–and they need it now!

HIGHER EDUCATION
KEEP IT BRIGHT

If you want to know more about what the college crisis means to you, and what you can do to help, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

*Sponsored as a public service, in cooperation with the Council for Financial Aid to Education*

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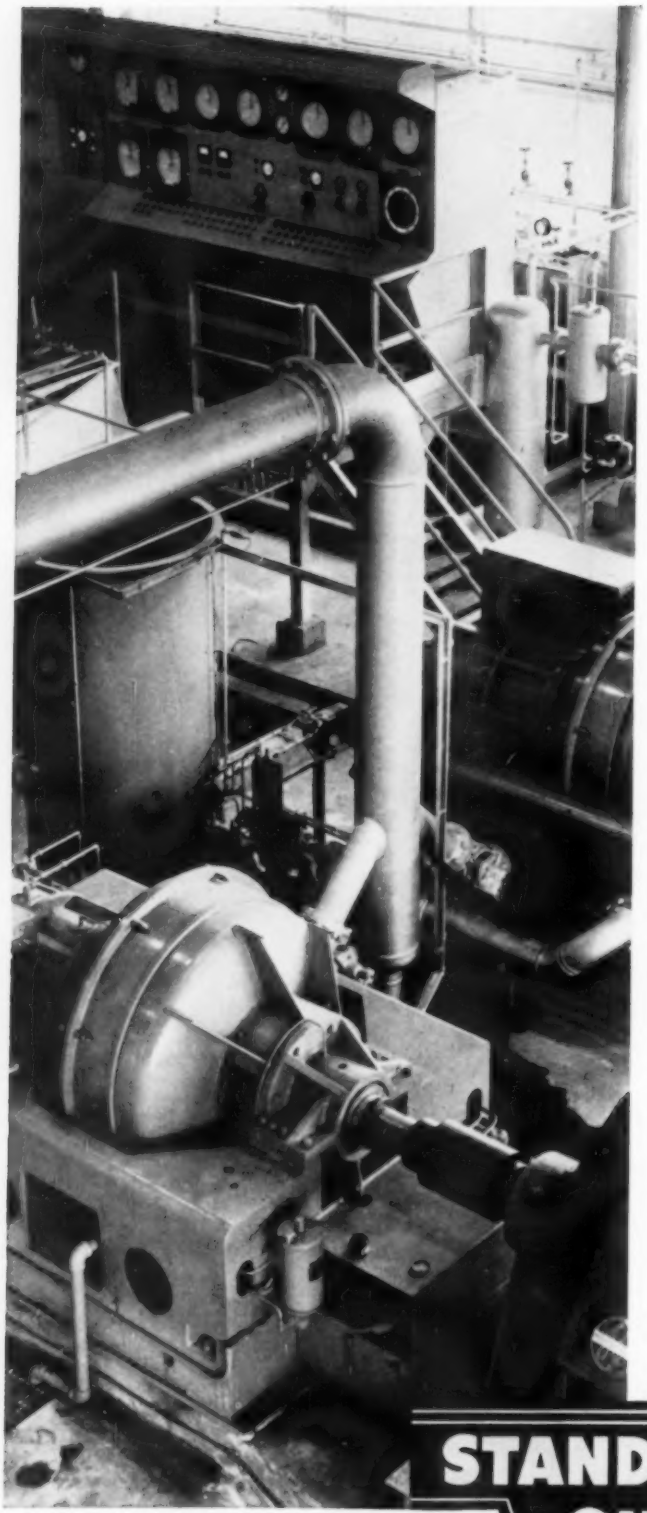

# experience has a cash value

In serving Southern industry with dependable lubricants for seventy-four years, our lubrication engineers have acquired experience that can be valuable to you. This experience is backed up by the combined facilities for testing and research behind Standard Oil lubricants that are unequaled.

Whatever your requirement may be — there's a Standard Oil lubricant designed to do your particular job with economy, dependability and efficiency.

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**LUBRICANTS**

**STANDARD OIL COMPANY**
(KENTUCKY)

# *Southern News Briefs (Continued)*

## Allis-Chalmers Pump-Turbines for Virginia

Two pump-turbines, matching the largest in the world in size, were recently ordered from **Allis-Chalmers** by the American Electric Power Service Corporation for **Appalachian Power Co.**, Roanoke, Va. The units are of the reversible pump-turbine type. Designs call for rated capacity of 87,000 hp at 180 ft net head when generating and 4100 cfs at 197 ft total dynamic head when pumping. Generator-motors are rated 101,500 hp at 106 rpm (as a motor) and 66,000 kw, at 13,200 volts, 69,500 kva at 95 per cent pf (as a generator).

Plans are now being completed to begin construction of a 227 ft high dam at Smith Mountain and a second dam about 18 miles downstream near Leesville, Va.

The upper dam's power station, containing four units, will include the two 101,500-hp pump-turbine units, and two other units rated 204,000 hp. The power station at the lower dam will house two fixed blade units each rated 32,300 hp.

Applying the pumped-storage concept, Appalachian Power will use the reversible units to pump water from the lower to the upper storage reservoir during off-peak periods. When generating power for the system seasonal or daytime peak loads, water will flow from the Smith Mountain reservoir through the two pump-turbines operating as generating units as well as through two conventional Francis turbines back into the lower reservoir.

## Clark Equipment — S.W.

Vic Vandevoir has been named district manager of the Southwest District of the Industrial Truck Division, **Clark Equipment Company**, with headquarters in Little Rock, Ark. He will coordinate sales in Arkansas, Oklahoma, Louisiana, Tennessee and Texas.

Mr. Vandevoir has been associated with the materials handling industry for 14 years. Prior to his appointment as district manager, he was a salesman for Clark's Little Rock dealer.

## Fluor Corp. — Houston

**The Fluor Corporation, Ltd.** recently announced the appointment of James P. Wiseman as vice-president of the company's Mid-Continent Division at Houston, Texas. He succeeds Ernest Moncrief, who was appointed to the newly created post of vice-president and coordinator of foreign operations and affiliates.

Mr. Wiseman, a graduate of Louisiana State University, has been with Fluor since 1942. Prior to that he was employed by Shell Oil Company and Maintenance Engineering Company.

## Rust Promotes Virginian

Oscar W. Underwood, III has been named assistant to the president of **The Rust Engineering Company**, replacing Crawford J. Cofer who has been assigned to other duties. Mr. Underwood joined the Estimating Department of Rust in 1958 after managing a construction firm for seven years at Charlottesville, Virginia. He is a graduate of the University of Virginia.

## National Power Show To Feature New Trends

New trends in industrial economy will be featured at the forthcoming **24th National Exposition of Power and Mechanical Engineering**, which will be held November 28 to December 2 at the New York Coliseum.

Already scheduled are such displays as a model of the nation's newest design and largest atomic power plant. This is to be a 360,000 kw closed cycle water reactor, projected by a large utility company and already well along in the planning stage. Another line of advanced development will be dieselized electric generators, compressors and similar independent units such as are used increasingly in construction and other field operations.

E. K. Stevens, president of the International Exposition Company, is manager of the Exposition. Permanent headquarters of the management are at 480 Lexington Ave., New York 17.

## AIEE Honors Texan

A certificate of honorary membership in the world-wide **American Institute of Electrical Engineers** was presented to **Elgin B. Robertson**, of **Dallas, Tex.**, during the Annual Meeting in Atlantic City.

Mr. Robertson, who is president of Elgin B. Robertson, Inc., and of Plastics Manufacturing Co., Dallas, is the 46th recipient. He was a director of the Institute from 1947 until 1953 and was its 1953-54 president. He is a native of Meridan, Tex., and received a degree in electrical engineering from the University of Texas in 1915.

## T. B. Wood's Sons — S.W.

Changes in Southwestern sales personnel are announced by **T. B. Wood's Sons Co.**, Chambersburg, Pa.

Ward C. Johnson, formerly field sales engineer, has been promoted to the newly created position of manager of Dallas operations, including the Fort Worth area.

Samuel S. Stuard, formerly at Philadelphia, has been transferred to the Southwest as district sales manager in the Houston, Tulsa and Dallas territories other than metropolitan Dallas and Ft. Worth.

## Commercial Solvents, S.E.

R. Paul Jolley has been named manager of the Atlanta district office of **Commercial Solvents Corporation.** Mr. Jolley joined CSC in 1959.

In his new capacity, he will direct the sales of agricultural chemicals and animal nutrition products in Florida, Alabama, Georgia, and the Carolinas.

(*Continued on page* 60)

# "CHARTS"

## *By SOUTHERN POWER & INDUSTRY gives quick solutions for everyday problems.*

This 74-page, 7x10" Manual Serves the Needs of Plant Engineering-Operating and Maintenance Personnel.

TABLE OF CONTENTS



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Firm _____ Position _____
Products manufactured
or nature of business _____

# INDUSTRY SPEAKS

## Engineers Must Gain Understanding of Their Work

Abstracted from the comments of
FRANCIS K. McCUNE
Vice-President-Engineering Services
General Electric Company
in his commencement address, June 11, 1960
at Georgia Institute of Technology in Atlanta

**A PRIME RESPONSIBILITY** of scientists and engineers, in this age of sharply accelerating scientific and technical progress, is to gain increased public understanding of their work and objectives, Georgia Institute of Technology graduates were told on June 11.

"Unless people understand what we are doing and the objectives we have in mind," he said, "we can expect less and less easy-going endorsement of our efforts — including our heavy use of natural resources and our power to produce radical change."

"If the march of scientific and engineering knowledge either should be halted for even a moment or should produce results which are for any reason deplorable, and the circumstances can be traced to our failure to help people understand, we shall have been derelict in duty, and we shall suffer with all men."

Tracing the progress of science and technology from the ancient Greeks to the present, Mr. McCune pointed out that man is acquiring more scientific knowledge and applying it with greater effect in ever-shorter intervals of time.

"The process of growth in knowledge and understanding, and in their application," he said, "is so rapid and so sharply accelerating as to tax scientists and engineers themselves to understand — let alone their fellow human beings."

He pointed out that the impact of this growth and speed upon all people is becoming steadily stronger and more immediate. "It has become a cliche," he declared, "to say that science has shrunk the world to a neighborhood. But I do not think it is trite thinking to remember that the spy satellite is of much more pronounced interest and potential to Mr. Citizen of any country than were the deliberations of Pythagoras to the Greek citizenry."

Referring to man himself as "the one historic constant which stands throughout all change," the G-E executive said that while it "has always been the nature of some men to inquire, to learn and to apply the new, it has also been the nature of all men to fear the unknown and to resist change."

He pointed out that creation of public understanding of their work is the engineers' answer to this inherent fear — a fear that prompts some people today to resist automation and demonstrate against nuclear testing.

"Working communication with your fellow-citizens, on their terms, must be, as far as I can see, a continuing condition of your employment. I do not think you can shirk this responsibility, and I hope you will not try," he declared.

"I know that practical opportunities to communicate will come your way immediately when you begin your work. If you join an organization — whether industrial, governmental or academic — you will promptly be involved with people in other aspects of the common enterprise. The same thing will happen with your neighbors and other citizen-associates. All these people will want to hear from you, and you must find common ground with them — however small or cramping to your vision it may at first be — and begin communicating."

# Brand new AUTOMATIC WATER SOFTENER

## Joins the Elgin Line ...at a new low, low price

This brand new Elgin Automatic Water Softener employs the Elgin time-proved multiport valve with simple, and therefore dependable, motorized lift-turn mechanism.

This simplicity of design not only gives it dependability of operation, but also permits selling it at a low, low price despite the fact that it is built to traditional Elgin quality standards.

Like all Elgin Water Softeners, this new automatic is also available in the revolutionary "Double-Check" design described below. Now more than ever before it will pay you to get a quotation from the Elgin man before you buy.

### Available in Elgin "Double-Check" design

Yes, this new automatic—and the softeners with the two other controls described opposite—are available in the "Double-Check" design which gives these money-saving features:

1. Zeolite locked in . . . prevents costly replacements.
2. Being locked in, zeolite can be backwashed more thoroughly without loss . . . to keep softener clean, efficient, long lived.
3. Clean, receptive zeolite bed, plus highly efficient brine distributing system, means complete regeneration with marked salt savings.
4. Deeper zeolite bed of "Double-Check" softener gives far greater softening capacity from given size softener or equal capacity from smaller one.

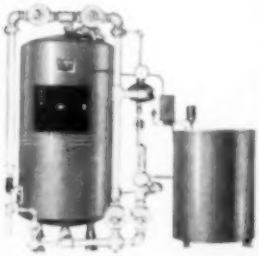
*Ask for Bulletin 615*

Complete facts about Elgin softeners and other equipment listed below are given in Bulletin 615. It is yours for the asking. So too are the services of the nearest Elgin representatives. They are listed in the yellow pages of phone books in principal cities under "Water Softening & Treatment."

### Choice of two other outstanding controls

**MANUAL MULTIPORT**

Thousands of water softeners with the manual multiport valve control attest to its excellent performance and rugged construction. All operating steps are controlled by one simple revolution of valve handle.



**HYDRAULIC ULTRAMATIC**

For those who want the finest in automatic operation, this hydraulic "Ultramatic" is the answer. Its time-proved hydraulic valves and automatic pilot give the ultimate in dependability and control.

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# TIMELY COMMENTS

## You Can't Cover Up Your Painting Sins

**INDUSTRIAL** men normally think of paints and coatings in terms of protection first and appearance second. Yet they are very conscious of both functions. Plant structures are normally quite expensive and any sacrifice in appearance or protection for the sake of cheapness tends to put the engineer in an absurd position.

On the other hand, cleaning and painting constitute a rather large portion of the maintenance budget. Consequently, sound economy is essential.

The ever present problem of keeping costs in proper balance is a difficult one. To spend twice as much for a paint job that will last twice as long looks like an even break — but there may be hidden benefits, such as less disturbance to the operating force, that make the more expensive job quite desirable. In another instance, soiling conditions make frequent painting necessary regardless of paint life — thus the cheaper job may be the best choice.

All of these problems of *best overall economy* might be easy to solve if we had time to gather statistics and establish merits of each product and procedure. But perhaps nowhere in industry is the buyer confronted with so many recommended products. And the list is constantly and rapidly growing.

Not only must the engineer look to the future in selecting products, but he must recognize that past decisions affect his choices for the future — just because a new product is good for a particular service does not mean that it can be applied over the previous product. Incompatibility exists in the paint shop as well as in the divorce court.

The engineering materials people as well as the coatings manufacturers must be considered. All of the alloys and claddings and synthetic materials have their places in combatting corrosion. Frequently it is most economical to start at the source of trouble and choose materials that will resist the corrosive conditions.

And still another opportunity may be present in way of alleviating the corrosive condition through better drainage, air dryers, exhausters, and anti-sweating insulations.

"It sure would be nice if someone would set up a standard code for paints and coatings." We hear that statement frequently. It has been tried. In fact, it has been done with fair satisfaction in some industries.

But such standards will not *stay put* for very long. Better products are constantly being made and better procedures are being developed. Consequently, anyone who tries to stick too close to standards will be missing out on the latest improvements.

Any standard that does not allow considerable opportunity for experimenting with "non-standard" procedures should be junked. A big plant should nearly always have a few experiments and tests going on. But tests and checks can be misleading. Improper cleaning, too short a period between coats, an extra humid day, a little too much thinner, and a host of other things can make a good paint look bad.

There is no *cure-all* paint. A certain amount of standardization is necessary for economy's sake and to preserve the sanity of the men in charge of painting work. But here, as in so many industrial decisions, conservative good judgment is the essential element.

To a great extent the engineer must get his recommendations from reputable suppliers and give them reasonable opportunity to prove the worth of their products.

Actually, difficulties are more likely to develop through fault of the appliers than the suppliers. Some of the finer points of applications are hard for the workman to accept. And it is only natural to avoid laborious procedures that seem foolish to the workman. But honest painters can be convinced by proper explanation and demonstration. No coating is good enough to offset the damage of sloppy application. That unremoved grease spot looms big when the paint pops off.

PAINTS

PRIMERS

COATINGS

CLEANERS

# PAINTS & PROTECTIVE COATINGS


SPRAYERS

BRUSHES

SCAFFOLDS

MASKS

# Paints & Coatings....

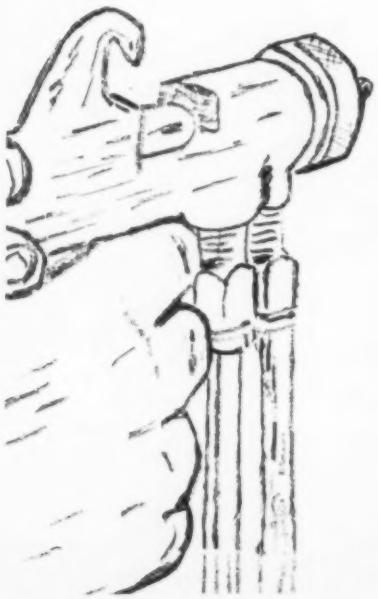
## Reference Guide and Buyer's Directory for the South-Southwest

**H-1—Industrial Finishes** — Color Card shows 64 shades in lacquers, synthetics, vinyls, and specialty finishes in a variety of lustres which include wrinkles, metallics, pearlized, and others. — CROWN PAINT INC.

**H-2—Protective Coatings** — Form 04579, 16 pages, illustrates and describes plant uses of special coatings for every corrosion problem, such as weather exposure, salt and fresh water, caustics. — THE GLIDDEN COMPANY.

**H-3—Maintenance Finishes** — Catalog, 24 pages, consists of color charts and selection data for interior and exterior finishes in factories, refineries, textile mills, and other plants. — THE GLIDDEN COMPANY.

**H-4—Paint Engineering** — Form No. 254, 12 pages, offers paint engineering assistance in planning the painting program, selection and color charts, suggestions for abrasion and heat resistant finishes and other special requirements. — PORTER PAINT CO.



**H-5—Paints & Services** — 1960 Catalog, 54 pages, gives simplified product recommendations for paints for different surfaces, and explains company's services to the customer. Includes brushes and related items. — PORTER PAINT CO.

**H-6—Corrosion Protection** — Form T97-15M-60, 12 pages, describes Bitumastic protective coatings to prevent corrosion of metal and deterioration of concrete and masonry. Includes photographs and application data. — KOPPERS COMPANY, INC., Tar Products Division.

**H-7—Surface Protection** — Standard Catalog, 12 pages, describes vinyl, epoxy and inorganic coatings for control of industrial corrosion and contamination. Supplementary bulletins cover Dimetcote and Zinkote, recent development of the company. — AMERCOAT CORPORATION.

**H-8—Corrosion Resistant Coatings**— Bulletin No. 259, 4 pages, catalogues Plasite coatings and application processes. Discusses preparation, primers, and thinners. — WISCONSIN PROTECTIVE COATING CORP.

**H-9—Primers & Paints** — Bulletin V-50 Revised, 4 pages, gives general specifications of flake silica graphite primers and paints for structural and industrial maintenance. — THE JOSEPH DIXON CRUCIBLE COMPANY.

**H-10—Heat Resisting Paints** — Bulletin V-89, 4 pages, covers technical data on heat resisting paints, what they are, how they work, surface preparation, temperature range, and other pertinent facts. — THE JOSEPH DIXON CRUCIBLE COMPANY.

**H-11—Aluminum Paint** — Bulletin No. 112351, 4 pages, describes an extra high heat resisting silicone base aluminum paint; suggests application methods for best results. — SPECO, INC.

**H-12—Metal Treatment** — Ospho folder, 4 pages, describes metal treatment to stop rust action and prepare rusted metal for paint, forming a bond between the rusted metal and paint. — RUSTICIDE PRODUCTS COMPANY.

**H-13—Spray & Mixing Equipment**— Catalog describes and illustrates the company's line of low pressure spray equipment, outlining principles of atomization, test results, uses in industrial plants. — ECLIPSE AIR BRUSH CO.

**H-14—Moisture-Vapor Barriers** — Nokorode Catalog of underbody coatings, rust preventives, industrial mastics, gives descriptions and specifications, and plant applications are illustrated with photographs. — LION OIL COMPANY, Div. of Monsanto Chemical Co.

**H-15—Corrosion Control** — Catalog discusses company research and services, describes primers and undercoatings, epoxies, acrylics, and other coating specialties. Includes users' guide. — PRUFCOAT LABORATORIES, INC.

**H-16—Waterproofing** — AIA File No. 7-D & 26-B-2 — 4 pages describe E-Bond #1007 Sealant, chemically cured rubber for permanent flexible waterproofing. Possible uses are listed, and technical sheet outlines general and physical properties. — INTERNATIONAL EPOXY CORPORATION.

**H-17—Rust Removal** — Folder, 6 pages, tells how Rust-I-Cide saves labor and avoids replacement costs by removing rust and conditioning metal surfaces. Describes variety of applications, gives prices. — RUSTICIDE PRODUCTS COMPANY.

**H-18—Masking Tapes** — Bulletin P59 107-59-1, 4 pages, describes all-purpose paper tapes for masking as well as for packaging, sealing, protecting, holding and identifying. — PERMACEL.

**H-19—Metal Protection** — General Catalog, 40 pages, describes Copon for corrosion control. Includes price list and color chart. Illustrated with photographs. — COAST PAINT & LACQUER CO.

**H-20 — Paint & Lacquers** — Booklet, 8 pages, furnishes prices and product information on line of paint, lacquers, and industrial finishes. Shows standard colors available in industrial synthetic enamel and pigmented industrial lacquer.—COAST PAINT & LACQUER CO.

## CATALOGS AND BULLETINS

**Reference literature available from manufacturers to help solve protective coating problems and apply materials and equipment.**

**Use Reader Service Card on Page 81**

**H-21—Spray Equipment** — Catalog M-53a, 32 pages, gives selection data and related information on spray equipment for maintenance painters. Explains essentials of a spray outfit. — THE DEVILBISS COMPANY.

**H-22—Spray Guns**—Catalog I-2000-a, 16 pages, covers manual, automatic, and special purpose spray guns and accessories. Nozzle guide and other useful charts are included. — THE DEVILBISS COMPANY.

**H-23—Pipe Mastics** — Bulletin, 4 pages, describes properties, economies, formulations, application and specifications for Roskote cold-applied pipe mastics. — ROYSTON LABORATORIES, INC.

**H-24 — Plant Colors** — Chart, 10 pages, shows wide variety of colors available for any method of application in industrial plant use. Plastic coatings, synthetic enamel, clear lacquers and other finishes are included. — UNITED LACQUER MFG. CORP.

**H-25—Industrial Coatings** — Catalog, 74 pages, gives information on the function and use of Truscon materials in new construction and building maintenance. Describes products available and gives technical data. — TRUSCON LABORATORIES.

**H-26—Corrosion Control Systems**—Booklet and Color Chart, a guide to primary protection and preventive maintenance of all metal surfaces subjected to: chemical attack of acids and alkalis; active industrial solvents; fumes and gases; severe industrial weathering. — TRUSCON LABORATORIES.

**H-27—High Temperature Paints** — Technical Bulletin No. 5, 2 pages, contains information about a new development in rust-inhibitive, high temperature paints for stacks, breechings, and boilers. — SUBOX, INC.

**H-28—Shop & Field Coatings** — Catalog 60, 28 pages, describes interior and exterior finishes for industrial uses, with samples of colors and types available. Illustrated with applicational photographs. — TNEMEC COMPANY, INC.

**H-29—Epoxy-Tar Coatings** — Bulletin 803, 4 pages, explains a new approach to coating protection by selection of coatings for a system to fit individual requirements. Gives physical properties and components of systems. — CARBOLINE COMPANY.

**H-30—Heavy Duty Coatings** — Bulletin No. 600, 4 pages, describes coatings for protecting structural steel, equipment, tanks, and floors against corrosion, with low cost per year of effective service. — CARBOLINE COMPANY.

**H-31—Chemical Resistant Enamels** — Folder No. 571-S, 4 pages, describes various types of chemical resistant enamels for floors and other industrial uses. Includes specifications. — INERTOL CO., INC.

**H-32—Corrosion Engineering Products** — Catalog includes sections on protective coatings, linings, interliners, acid proof cement mortars, with resistance charts, specifications and other pertinent data. — PENNSALT CHEMICALS, Corrosion Engineering Products Dept.

**H-33—Airless Spray Process**—Form No. 301-066, 8 pages, describes the Hydra Spray for application of protective coatings, tells how it increases savings, how it works, and selection available. — GRAY COMPANY, INC.

**H-34—Spray Painting** — Section A, 30 pages, catalogs spray painting equipment available for industrial use, with engineering data and specifications. Illustrated with photographs, drawings, and charts. — GRAY COMPANY, INC.

**H-35—Hydraulic Spray** — Bulletin 404R, 4 pages, describes No-Air Dyna-Spray System, a simple hydraulic spray painting method requiring no atomizing air or material heating, designed for application of protective and decorative coatings. —LINCOLN ENGINEERING COMPANY.

**H-36—Maintenance Gun** — Brochure describes the Von Arx Air Gun —lightweight tool for tough cleaning, de-scaling and de-rusting jobs. Air-operated reciprocating needles adjust to contours automatically. Three sizes. Comes in handy kit with accessories. — MARINDUS COMPANY.

**H-37—Maintenance Ideas** — 4-page folder highlights 90 ways Kano Kroil and other products can help the man-in-the-plant.—KANO LABORATORIES.

**H-38—Roof Maintenance** — 4 page Catalog 5D describes Dri-N-Tite products for patching, priming and coating composition, corrugated or sheet metal, slag, gravel, concrete and felt roofs. — A. C. HORN COMPANIES.

**H-39—Maintenance Painting**—"How to Reduce Painting Costs," 12-page booklet, is an illustrated guide to economical maintenance painting. Gives formula for comparing paint costs; three ways to save; discusses spray painting compared to brush or roller jobs. — BARRELED SUNLIGHT PAINT COMPANY.

**H-40—Anti-Corrosive Paints** — Bulletin "The Application of Subox and Subalox Paints" — Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application. — SUBOX, INC.

**H-41—Floor Maintenance** — 4 page catalog describes metallic, asphalt, latex, epoxy and other products for hardening, resurfacing and patching concrete or wood floors. — A. C. HORN COMPANIES.

**H-42—Anti-Rust Paint** — Bulletin RAR-2, 1 page, gives price list and features of Rustrem anti-rust paint designed to provide complete coverage in one coat without use of a primer, for all metal applications, indoors or out. — SPECO, INC.

**H-43—Corrosion Control Systems** — Five-step procedure outlined in Brochure 9111 for primary protection and preventive maintenance of all metal surfaces subject to acids, alkalis, solvents, fumes and gases.—TRUSCON LABORATORIES.

**H-44—Fire-Retardant Paint** — Bulletin No. 100, 12 pages, explains how fire retardant paint works and how it is applied in industrial buildings to reduce fire hazards. — ALBI MANUFACTURING CO., INC.

## Paints and Coatings Reference Guide for the South-Southwest . . . . . .

**H-45—Painting New Plants** — "Plan Painting of New Plants to Reduce Costs" describes how company's lead-suboxide paints can save 1 or 2 coats of paint on new plants. Eventual repainting costs are cut as well since these paints form a dense, metallic lead film which can be recoated without expensive scraping, sanding or repriming. — SUBOX INC.

**H-46—Roof Coating** — Booklet "Natural Rubber — its effect on exposed roof and masonry surface" plus information on durable asphalt protective coatings for roofs. — GARDNER ASPHALT PRODUCTS CO.

**H-47—Ceramic Coatings** — Chempro sprayed ceramic coatings to resist abrasion, erosion and corrosion described in Bulletin CP-28. Ideal for shaft, shaft sleeves, impellers, valves, cams, etc. — CHEMICAL & POWER PRODUCTS, INC.

**H-48—Neoprene Asphaltic Coating** —Data folder describes the new Gacote NA-62 economical coating resistant to weathering, moisture and mild chemical service. No primer required; easily applied to damp surfaces; will not crack in cold temperatures. — GATES ENGINEERING COMPANY.

**H-49—Airless Spray Gun** — Bulletin, 1 page, tells how for the first time airless spray without heat will produce a quality finish. Chart compares the Spee-Flo HydraAirless 20/H Gun with other airless systems. — THE SPEE-FLO COMPANY.

**H-50—Rust Inhibitor** — Bulletin, 2 pages, describes "Poly-Rustex," a special combination of active materials dispersed in an oil carrier base to give long lasting corrosion protection to metals with a single, low-cost application.—BRAD CHEMICAL, INC.

**H-51—Emulsion Coatings** — Bulletin, 1 page, discusses two new cold-applied emulsion coatings — Bituplastic No. 33, having high resistance to permeation by chemicals, for heavy duty service; and Bituplastic No. 44, a general purpose insulation mortar. — KOPPERS COMPANY, INC.

**H-52—Rust Preventive** — Bulletin, "Rust-Pel No. 5," announces a concentrated rust-proofing, formulated compound which is added to water in recommended proportions and can be applied by dipping, brushing or spraying. — THE MITCHELL - BRADFORD CHEMICAL COMPANY.

**H-53—Epoxy Coating** — Bulletin P-42, gives information on a new practical epoxy industrial coating marketed under the name Tile-Coat, a poly-amide cured equal-mix which offers protection to wood, concrete, and metal surfaces. — WILBUR & WILLIAMS COMPANY, INC.

**H-54—Silicone Waterproofing** —Data sheet describes full strength compound for cement buildings. Designed specifically for Southern climates. — GARDNER ASPHALT PRODUCTS CO.

# Buyer's Directory . . . . . .

**This tabulation lists many of the important paints and coating suppliers and their representatives in the South and Southwest. Some manufacturers, however, failed to furnish information requested.**

### AMERCOAT CORPORATION, 4809 Firestone Blvd., South Gate, California

Florida, Jacksonville: Amercoat Corporation, 2404 Dennis St. Phone EVergreen 9-7495

Texas, Houston: Amercoat Corporation, 6530 Supply Row. Phone WAlnut 3-2878

### THE ARCO COMPANY, 7301 Bessemer Ave., Cleveland 27, Ohio

North Carolina, Cary: Matthew T. Brady, Jr., 407 Robert St. Phone HOpkins 7-9356

Oklahoma, Oklahoma City: William S. Clogston, P. O. Box 19. Phone JAckson 4-0724

### ATLAS MINERAL PRODUCTS COMPANY, 141 Whiteoak St., Mertztown, Pa.

Alabama, Birmingham 9: Industrial Products Company, 2815 18th Street, South. TRemont 9-5802

Texas, El Paso: Bernard Rodsky, P. O. Box 1593, First National Bank Bldg. KE 2-5747

Texas, Houston 27: Mercer Engineers, Inc., 3615 Meadow Lake Road. JAckson 8-5152

### BARRELED SUNLIGHT PAINT COMPANY, 4-15 Dudley St., Providence 1, R. I.

Georgia, Roswell: Preston R. Singletary, Riverside Road. Phone ROswell 4050

Maryland, Baltimore: Robert M. Sinn, 6711 Alter St. Phone HU 6-8497

North Carolina, Charlotte: Thomas C. Roggenkamp, Asst. Sales Mgr. — Southern, 5048 Murrayhill Rd. Phone JAckson 3-7351

Virginia, Richmond: Everett M. Trites, 2021A Park Ave. Phone ELgin 9-1255

### CARBOLINE CO., 32 Haney Ind. Ct., St. Louis 17, Mo.

Alabama, Mobile: Applied Eng. Sales, P. O. Box 2158. Phone GReenwood 9-1363

Florida, St. Petersburg 33: John J. Parkinson, P. O. Box 10665. Phone 5-7708

Louisiana, Metairie: W. Crawford, P. O. Box 362. Phone VErnon 3-8563

North Carolina, Charlotte: L. E. Parks, 1413 Wachovia Bank Bldg. Phone FRanklin 6-6873

### COAST PAINT AND LACQUER CO., P. O. Box 1113, Houston 1, Texas

Louisiana, New Orleans: Owen McMullen, Box 11 Harvey

Louisiana, Shreveport: Sid Ingram, Box 5031 Southfield Station

Texas, R. M. Johnson, Sales Mgr.

### THE DEVILBISS COMPANY, 300 Phillips Ave., Toledo 8, Ohio

Alabama, Birmingham 8: C. A. Walker, 1303 West 35th St. STate 6-1263

Arkansas, North Little Rock: J. G. Farmer, Jr., 205 East I, Park Hill. SKyline 3-0208

Georgia, Atlanta 18: The DeVilbiss Company, R. F. Steele, Regional Sales Mgr., 1100 Northside Dr., N. W. TRinity 5-0554

Florida, Jacksonville Beach: McDuff Cain, 1234 Seventh Ave. N. CHerry 9-4022

Louisiana, New Orleans 22: O. J. Charbonnet, 2366 Dreux Ave. MAgnolia 6829

North Carolina, Charlotte: J. S. McNamara, 1100 Roanoke Ave. KEystone 7-4626

North Carolina, Winston-Salem: W. L. Gilbert, Jr., 2371 Elizabeth Ave. PArk 3-1896

Oklahoma, Tulsa 5: W. E. Pickens, 1524 East 36th St. RIverside 2-9920

Tennessee, Knoxville 6: A. E. Clevenger, 1017 Weymouth Lane. Phone 4-3783

Tennessee, Memphis 11: John W. Anderson, Jr., 1285 Parkland Rd. FAirfax 7-5222

Texas, Dallas 7: The DeVilbiss Company, W. C. Spruce, Regional Sales Mgr., 2506 Irving Blvd. RIverside 1-4052

Texas, Houston 5: Omer Rhodes, 2365 Dunstan Rd. JAckson 9-3775

Texas, Lubbock: J. R. Herring, 4202 37th St. SWift 9-6726

## THE JOSEPH DIXON CRUCIBLE COMPANY, 167 Wayne St., Jersey City 3, N. J.

Georgia, Avondale Estates: H. J. Heinz, 20 Dartmouth Avenue. DRake 8-5167

North Carolina, Charlotte 3: R. C. Alley, 1426 Waverly Avenue. EDison 4-8520

Texas, Houston 24: R. E. Harris, 8566 Ridgepoint Drive. HOmestead 5-5962

Virginia, Richmond 21: W. P. Kennedy, 24 Holly Drive. ELgin 9-5830

West Virginia, Huntington 5: H. M. Hayden, 20 Mohawk Trail. JAckson 2-0886

## ECLIPSE AIR BRUSH CO., 390 Park Ave., Newark 7, N. J.

Alabama, Birmingham 1: Mill & Textile Supply Inc., 3130 Third Ave., South

D. C., Washington 1: A. I. Robertson, 1108 Ninth St., N. W. Phone NOrth 7-4084

Texas, Houston 24: W. A. Wood, Jr., 8827 Chatsworth. Phone UNderwood 4-2230

## GARDNER ASPHALT PRODUCTS CO., 912 Ruby St., Tampa, Fla.

## GATES ENGINEERING COMPANY, 100 South West St., Wilmington 99, Delaware

Florida, Jacksonville: Armour Paint Company, 1075 West Adams St. ELgin 5-1414

Louisiana, Shreveport: Hines Vaughan, 920 Kirby Place, 4-8895

North Carolina, Elizabeth City: Elizabeth City Iron Works, Riverside Ave. Phone 8616

Texas, Dallas: Texas Coatings Co., Inc., 172 Leslie Street. RIverside 1-3226

West Virginia, Charleston: General Engineering Co., 3406 Chesterfield Ave., S. E. WA 5-5312

## THE GLIDDEN COMPANY, 900 Union Commerce Building, Cleveland 14, Ohio

Alabama, Birmingham: 2301-07 Sixth Avenue South. Phone ALpine 1-0273

Alabama, Mobile: 1610 Government Street. Phone GReenwood 9-5471.

Florida, Ft. Lauderdale: 1113 Sunrise Blvd. Phone JA 3-8925

Florida, Jacksonville: 344 Riverside Avenue. Phone EL 3-4447

Florida, Miami: 5400 N. Second Avenue. Phone PLaza 8-2596

Florida, Orlando: 2000 E. Colonial Drive. Phone GA 3-2575

Florida, Tampa: 3120 Grand Central Avenue. Phone REdwood 6-5179.

Georgia, Albany: 116 North Front Street. Phone HE 6-2212

Georgia, Atlanta: 375 Luckie Street, N. W. Phone MU 8-6075

Kentucky, Louisville: 100 West Broadway Phone JU 3-7708

Louisiana, New Orleans: 424 Josephine Street, P. O. Box 980. Phone MA 2022

Maryland, Baltimore: 2834 Loch Raven Road. Phone LE 4845

Maryland, Wheaton: 11242 Georgia Avenue

Missouri, Kansas City 10: 1214 East 47th St.

Missouri, St. Louis 2: 106 Gratiot Street.

North Carolina, Asheville: 77 Coxe Avenue. Phone ALpine 3-0434

North Carolina, Charlotte: 1001 South Independence Blvd. Phone ED 3-3737

North Carolina, Durham: P. O. Box 96, West Durham Station. Phone DU 8-2249

North Carolina, Greensboro: 1225 Battleground Road. Phone BR 5-4508

North Carolina, Raleigh: 713 West Peace Street. Phone TE 3-9929

Oklahoma, Oklahoma City: 900 North Robinson Avenue. Phone CE 9-1531

South Carolina, Greenville: 626 North Main Street. Phone: CE 9-8481

Tennessee, Chattanooga: 901 Central Avenue. Phone AM 5-4557

Tennessee, Knoxville: 319 Wall Avenue. Phone 3-6138

Tennessee, Memphis: 412 North Cleveland Street. Phone BR 2-1729

Tennessee, Nashville: 1301 Church St. Phone AL 4-6554-5

Texas, Austin: 5605 Burnet Road (PO Box 9201). Phone GR 3-7359

Texas, Corpus Christi: 4125 South Alameda Street. Phone UL 3-6259

Texas, Dallas: 1003 Dragon Street (PO Box 10126). Phone RI 7-0628.

Texas, Dallas: 324 Preston Forest Village. Phone EM 1-7374

Texas, El Paso: 700 Montana Street (PO Box 3132, Sta. A). Phone KE 2-5416

Texas, Houston: 2300 Main Street. Phone FAirfax 3-8338

Texas, Lubbock: 2611 34th Street. Phone SH 4-8455

Virginia, Newport News: 7311 Virginia Avenue. Phone CH 4-6321

Virginia, Norfolk: 3449 Military Highway. Phone UL 3-4312

Virginia, Richmond: 117 West Broad Street. Phone MI 4-0351

West Virginia, Parkersburg: 182 Park Center Drive. Phone GA 2-6567

## GRAY COMPANY, INC., Graco Square, Minneapolis 13, Minn.

Georgia, Atlanta 6: F. Smith, 1223 Spring St. NW. TR 6-6374

Florida, Jacksonville 5: E. Moon, Box 6292. EV 9-3222

Kentucky, Fort Thomas: C. Mueller, 84 Azalea Terrace. HI 1-9471

Missouri, Kansas City 8: R. Myers 1717-19 Oak Street. VI 2-1959

Missouri, Webster Groves 19: K. Hammer, 1273 South Rock Hill Road. WO 1-2742

North Carolina, Greensboro: R. Haislet, 3912 N. Fremont Drive. CY 9-6239

Tennessee, Memphis 11: D. West, 42 Normandy Circle. FA 4-2587

Texas, Dallas 24: W. Turnell, 521 South Manus Drive. WH 3-4295

Texas, Houston 3: J. Seifert, 1913 Leeland Avenue. CA 7-1771

## A. C. HORN COMPANIES, 2133 85th St., North Bergen, N. J.

Florida, Jacksonville: T. Rasmussen, 3116 Greenfield Circle. Phone EX 8-5419

Florida, Orlando: M. Shaw, P. O. Box 2947. Phone GA 3-9704

Georgia, Atlanta: H. Hart, 3011 Horseshoe Drive, S. E. Phone DR 3-5241

North Carolina, Albemarle: Ed Hooks, 338 E. Main St. Phone YU 2-2823

North Carolina, Charlotte: O. Wall, P. O. Box 2184. Phone ED 3-4749

South Carolina, Spartanburg: C. O'Neale, P. O. Box 562. Phone SP 3-1613

Tennessee, Knoxville: B. Smith, 2509 Parkview. Phone 3-0024

Tennessee, Memphis: E. Turley, 1278 Union Avenue. Phone BR 6-9597

## Paints and Coatings Reference Guide for the South-Southwest . . . . . .

### INDUSTRIAL PAINT MFG. COMPANY, 915 North 33rd St., Birmingham 1, Alabama

Alabama, Mobile: Indurall Paint Center, 1300 Dauphin St. HE 2-3125

Alabama, Montgomery, Indurall Paint Center, 1717 Norman Bridge Rd. AM 3-8130

Louisiana, New Orleans: A. L. Lacamp, 3801 Napoleon. TW 8-8271

Mississippi, Columbus: Perkins-Parsons Co., Columbus, Mississippi. FA 8-8271

### INERTOL CO., INC., 480-490 Frelinghuysen Ave., Newark 12, N. J.

Alabama, Birmingham 13: L. E. Sturgis, 2550 Beverly Drive. TRemont 9-5441

Georgia, Hapeville: C. A. Letz, Jr., P. O. Box 387. POplar 7-8561

Louisiana, New Orleans: Glenn Porter, P. O. Box 2440. JAckson 5-6817

North Carolina, Charlotte 4: Purser & London, Inc., 1317 East 4th Street. EDison 3-7549

Texas, Dallas 6: C. H. Hartman, P. O. Box 4904. TAylor 3-4933

Virginia, Arlington 4: Earl H. Lee, 2508 Arlington Blvd. JAckson 5-4773

### KOPPERS COMPANY, INC., Koppers Bldg., Pittsburgh 19, Pa.

Alabama, Birmingham 9: H. W. Hensel, 2572 Mountain Woods Dr. TR 9-7477

Alabama, Birmingham 9: E. G. Riha, 2313 Farley Place. TR 9-9394

Alabama, Birmingham: D. A. Stolzman, Rt. 13, Box 1220. TR 1-0579

Alabama, Woodward: John Hancock, Koppers Company, Inc. STate 8-1611

Florida, Jacksonville 11: E. E. Sandberg, 10567 Serena Drive. RA 4-5892

Louisiana, Gretna: Mavor-Kelly Co., 1038 Fourth St.

Louisiana, Shreveport: J. E. Thistlethwaite, 3556 Greenway Place. Phone 7-8929

North Carolina, Charlotte: J. W. Tyson, Jr., P. O. Box 1688

South Carolina, Columbia: W. R. Hawkins, 1513 Berkeley Rd. AL 4-3528

Tennessee, Nashville 5: F. J. Sullivan, 102 Alton Road. CY 2-3918

Texas, Houston 24: O. G. Toelke, 4406 Randwick Drive. OV 2-3481

Texas, Houston 2: Mavor-Kelly Co., 660 M. & M. Bldg.

Texas, Houston 21: F. M. DeRouen, 3710 Cosby Avenue

### LINCOLN ENGINEERING CO., Div. of McNeil Mach. & Engrg. Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

Georgia, Atlanta 13: Lincoln Engineering Co., 1349 Northside Drive, N.W. Phone TRinity 6-7549

Georgia, Atlanta 19: Robert C. Doss, 2069 Fairway Circle, N. E. Phone MElrose 4-4874

Texas, Fort Worth 7: Keller-Hyden, Inc., 3341 Winthrop. Phone PErshing 8-5451

### LION OIL COMPANY DIVISION Monsanto Chemical Company, Lion Oil Bldg., El Dorado, Arkansas

Georgia, Decatur: Richard L. Hager, D-2, 2477 North Decatur Road. Phone DRake 3-7003

Texas, Houston 18: John W. Walker, 5401 Verdome Lane. Phone OVerland 2-5072

### MARINDUS COMPANY, 55 Pine St., New York 5, N. Y.

### METAL AND THERMIT CORPORATION, P. O. Box 471, Rahway, N. J.

Georgia, Atlanta: Metal & Thermit Corp., 565 Western Ave., N.W. JAckson 3-0415

Georgia, Atlanta: Bennet Brooks, 10 Alden St., N.W., Apt. 16.

Kansas, Prairie Village: Richard A. Brown, 5640 W. 82nd St., Prairie Estates

### MINNESOTA PAINTS, INC., 1101 Third St., South, Minneapolis 15, Minn.

Georgia, Atlanta: Minnesota Paints, Inc., 1314 Murphy Ave., S.W. Phone PLaza 3-5151

Texas, Dallas: Minnesota Paints, Inc., 737 Regal Row. Phone FLeetwood 2-1744

### NATIONAL CHEMICAL & MFG. COMPANY, Luminall Paints Division, 3617 South May St., Chicago 9, Ill.

Florida, Ft. Lauderdale: R. T. Edington, 1607 S.E. 13th Street

Florida, Tampa: Jas. S. Knight, 4507 St. Vincent Drive

Louisiana, New Orleans: T. C. O'Brien, Jr., 6029 Vicksburg

Oklahoma, Oklahoma City: Wm. R. Popplewell, 245 E. Coe Dr.

South Carolina, Greenville: J. Chas. Burns, P. O. Box 5214, Station B

Tennessee, Memphis: Robert O. McGee, 934 Faxon Avenue

Texas, Amarillo: S. H. Onstott, 1904 Cedar St.

Texas, Austin: Tom Appling, 2708 Gerachty

Texas, Dallas: Fred A. Eggert, 11615 Cimarec St.

Texas, San Antonio: Hal Goggan, 315 W. Kings Hwy.

### PAASCHE AIRBRUSH COMPANY, 1909 W. Diversey Parkway, Chicago 14, Ill.

Alabama, Birmingham: Pete LaVoie, 4048 Dolly Ridge Road. Phone TRemont 9-7162

Florida, Bradenton: E. P. Brose, 1816 26th St. Phone BRadenton 5-4604

Missouri, St. Louis: Paasche Airbrush Co., 2330 Hampton Ave. Phone MIssion 7-0281

### PENNSALT CHEMICALS CORPORATION, Natrona, Pa.

Alabama, Birmingham: George S. Edwards, 1918 28th Avenue, So. TRemont 9-1633

Florida, Winter Park: R. C. Kany, 1334 Palmetto Avenue. MIdway 4-7347

Louisiana, New Orleans: A. R. Ryan, 5439 Eads St. FAirview 2125

North Carolina, Raleigh: A. Lynn Thomas Co., Inc., Wake Forest Rd. & Sal Underpass. Phone 3-8231

South Carolina, Columbia: A. Lynn Thomas Co., Inc., 1047 D. Key Road. Phone 3-5007

Texas, Houston: Kaiser Refractories & Chemicals Div., P. O. Box 1775. FAirfax 3-0307

Virginia, Richmond: A. Lynn Thomas Co., Inc., 1814 High Point Avenue. ELgin 8-6785

### PERMACEL, U. S. Highway #1, New Brunswick, N. J.

Georgia, Atlanta: Permacel, 1080 Dill Ave., S. W. Phone PLaza 8-2651

Texas, Dallas: Permacel, 9000 Denton Drive. Phone FLeetwood 2-3955

### PORTER PAINT CO., INC., Box 1439, Louisville 1, Ky.

Alabama, Huntsville: Van Valkenburgh Bros., 816 Wheeler Ave., N.W. JEfferson 2-3546

Florida, Tampa: Porter Paint Co., 1102 Whiting St. Phone 2-0386

Georgia, Decatur: T. L. Griffin & Son, 1677 Lawrenceville Road. ME 6-5744

Kansas, Topeka: Roach Hardware Co., 1321 W. 21st St. CEntral 3-9606

Kentucky, Lexington: Porter Paint Co., 283 E. High St. Phone 2-3808

Kentucky, Louisville: Porter Paint Co., 801 S. Third St. JU 3-2701

Missouri, Kansas City: Schutte Lumber Co., 3001 Southwest Blvd. VAlentine 1-4600

Missouri, St. Louis: Porter Paint Co., 6717 Clayton Road. PA 7-4777

Tennessee, Nashville 3: Beasley & Sons Co., 147 Third Ave. ALpine 5-3163

### PRUFCOAT LABORATORIES, INC., 63 Main St., Cambridge 42, Mass.

Florida, Mulberry: Metalcoat, Inc., 513 E. Canal Street

Georgia, Atlanta 5: Stanley C. Powers, 6380 Vernon Woods Drive, N. E. BLackburn 5-2648

Louisiana, Covington: Herbert A. Irish, Route 1, Box 307. COvington 2143-J

North Carolina, Charlotte 8: James E. Ellis, 3132 Graymont Drive. FRanklin 5-1293

### ROYSTON LABORATORIES, INC., 128 First Street, Blawnox, Pittsburgh, Pa.

Florida, St. Petersburg 33: Murray Newell, P. O. Box 10655. ORange 1-1604

Georgia, Atlanta: E. M. Steinmann, P. O. Box 1084. DRake 8-9690

Tennessee, Signal Mtn.: Harry M. Love, 304 Dawn Street. TUcker 6-2655

Texas, Houston 4: W. R. Curley, P. O. Box 8188. JAckson 9-6659

Texas, Midland: L. R. Wood, 1605 Ventura St. MUtual 2-0642

### RUSTICIDE PRODUCTS COMPANY, 3125 Perkins Ave., Cleveland 14, Ohio

### RUST-OLEUM CORPORATION, 2425 Oakton St., Evanston, Ill.

Florida, St. Petersburg: J. W. Prevatt, 7912 Third Ave. Phone DI 5-8779

Mississippi, Rolling Fork: O. B. Casanova, P. O. Box 456. Phone 662

North Carolina, Chapel Hill: Henry Hurlburt, P. O. Box 1288. Phone 9-6177

Tennessee, Nashville: H. W. Edwards, Sr., 409 Tuck Bldg., 1123 Church St. Phone AL 6-0247

Texas, Dallas: Miss M. McConnell, 3200 McKinney Ave. Phone LA 8-7453

### RUST-SELE COMPANY, Division of Olo Paint Corporation, 9808 Meech Ave., Cleveland 5, Ohio

Alabama, Birmingham: Sam A. Bailey & Associates, Route 13, Box 942. Phone TR 1-5745

Florida, Pensacola: Pensacola Mill Supply, Inc., 3030 N.E. Street

Louisiana, Alexandria: Brown-Roberts Hdwe. & Supply, 1810 Third St.

Louisiana, Baton Rouge: Broussard Paint Co., 1053 North Blvd.

Louisiana, Houma: Houma Distributors, Inc., 1703 Barrow St.

Louisiana, Lafayette: Brown-Roberts Hdwe. & Supply

Louisiana, New Iberia: Iberia Supply Co., Inc., P. O. Box 976

Louisiana, New Orleans: George E. Egdorf, P. O. Box 1265. WHitehall 0-2222

Louisiana, New Orleans: Delta Ship Service Co., Inc., 923 Tchoupitoulas St.

Tennessee, Knoxville 17: Browning Belting & Supply, 801 E. Jackson

### SOUTHERN PIPE COATING COMPANY, 795 Peachtree St., N. E., Suite 330, Atlanta 8, Georgia

Alabama, Birmingham 9: E. E. Raughley, 3804 Jackson Blvd. Phone TR 9-8827

Georgia, Atlanta 8: Harold F. Ford, Sales Mgr., 795 Peachtree St., N. E. Phone TR 5-7511

### SPECO, INC., 7308 Associate Ave., Cleveland 9, Ohio

Alabama, Montgomery 2: H. G. Brock, P. O. Box 1541. AMherst 3-4135

Georgia, LaGrange: Clyde O. Cronic, 606 N. Greenwood St. Phone 8742

Louisiana, Belle Chasse: Lewis J. Oakes, Box 262, Route 1. FOrest 1-2138

Louisiana, New Orleans 4: C. S. Phillips, P. O. Box 1107. MAgnolia 4561

Oklahoma, Oklahoma City: Orville Henderson, 3820 N.W. 22nd St.

Oklahoma, Oklahoma City: Lewis A. Poynter, 2808 N.W. 44th St. WIndsor 2-3321

Texas, Houston 17: Henry Stein, 7011 Sloan St. OLive 4-6492

### SPEE-FLO COMPANY, 6614 Harrisburg Blvd., Houston 11, Texas

Florida, Miami 68: Chas. H. Mitchell, 14095 N.W. 6th Ave. Phone MU 1-8423

Georgia, Atlanta 7: J. Edwin Kerr, 802 Lullwater Rd. N. E. Phone DR 3-0203

Georgia, Atlanta 19: J. C. McCord, 3932 Peachtree Rd. N. E. Phone CE 3-0465

Louisiana, Baton Rouge: Arch Evans, 1815 Glendale. Phone DI 2-2704

Mississippi, Jackson: R. T. Douglas, P. O. Box 9224 Bratton Sta. Phone FI 5-2885

Missouri, St. Louis 28: Herbert A. Hansen, 10808 Leebur Drive. Phone VI 3-3800

North Carolina, Charlotte: Joe N. Williamson, 329 Circle Ave. Phone ED 4-3504

Tennessee, Memphis: Claude A. Ward, 1503 Union Ave. Phone BR 6-1312

Texas, Dallas: Norman Cooper, 3316 Dartmouth Ave. Phone RI 7-6849

Texas, Houston 18: Bill Spence, 3227 Mercer. Phone JA 9-7053

### SUBOX INC., Fairmount Plant, Hackensack, N. J.

Arkansas, Pine Bluff: M. L. Cooper, 506 Simmons Nat'l Bldg., P. O. Box 3. Phone JE 4-2530

Georgia, Atlanta 18: Roy E. Wilson Co., 1062 Northside Drive, N. W. Phone TR 6-8833

Louisiana, Baton Rouge: E. J. Michael, Jr., P. O. Box 2682. Phone DI 3-2072

Louisiana, New Orleans 12: C. F. Dunn, 519 S. Peters St. Phone JA 5-5423

Louisiana, Shreveport: R. B. Williamson, 104 Edwards St., P. O. Box 1687. Phone SH 4-6638

Mississippi, Jackson: S. C. Commander, P. O. Box 4686, Fondren Station. Phone EM 2-1142

Missouri, Kansas City: P. H. McKinley, Williams & McKinley Sales Co., 417 Grand Ave. Phone GRand 1-6868

Missouri, St. Louis: R. H. Harper, Williams & McKinley Sales Co., 1344 Wilton Lane, Kirkwood. Phone YOrktown 6-3694

New Mexico, Albuquerque: C. R. Peterson, 620 Rankin Road, N. E., P. O. Box 3275, Sta. D. Phone DI 4-8655

Oklahoma, Tulsa: George Demecs, P. O. Box 497. Phone RI 7-5316

Tennessee, Memphis: Curtis H. Stout, Inc., Crawford Jordan, 718 M&M Bldg. Phone JA 6-7601

Texas, Amarillo: C. L. Bass, 2404 West 7th St., P. O. Box 3584. Phone DR 2-7515

Texas, Beaumont: C. V. Ing, Jr., P. O. Box 3164 Phone TE 8-5652

Texas, Corpus Christi: J. R. Gallaher, P. O. Box 52. Phone TU 4-2185

Texas, Dallas 7: O. C. Skeeters, 340 Cole St. Phone RI 1-5831

Texas, Houston 20: P. K. Clifton, 5541 Armour Drive. Phone WA 1-2156

Texas, San Antonio: Dale G. Seay, P. O. Box 1324. Phone TA 6-6683

Virginia, Salem: George L. Wallace, 746 Elizabeth Ave., P. O. Box 362. Phone DU 9-4306

### THE TAPECOAT COMPANY, 1521 Lyons St., Evanston, Ill.

Alabama, Birmingham 9: L. W. Brouillette, 201 LaPrado Place

North Carolina, Belmont: Dean N. Lawing, P. O. Box 48, Catawba Heights, Charlotte

Oklahoma, Perry: Darrel C. Danley, 1616 Elm Street

Texas, Houston 2: Mavor-Kelly Company, 660 M and M Building

### TNEMEC COMPANY, INC., 123 West 23rd Ave., North Kansas City 16, Mo.

Alabama, Birmingham 9: Dick Whitney, 2811 S. 20th St. Phone TR 9-1761

Florida, Jacksonville 10: Bill Wood, 3864 Baltic St. Phone EV 4-7712

Florida, Miami (Coral Gables): Henderson & Johnson, 389 Cranello Ave. Phone HI 8-4486

Florida, St. Petersburg 33: Lee Anderson, P. O. Box 11105. Phone 7-4528

Kentucky, Louisville 3: Edwin Penna III, 529 Zane St. Phone JA 4-6712

Louisiana, Shreveport: G. Barney Blair, 1419 Audubon. Phone UN 5-3352

Missouri, North Kansas City 16: Tnemec Company, Inc., 123 W. 23rd Ave. Phone BA 1-1832

Missouri, St. Louis (Webster Groves) 19: Larry Carlin, 117 Helfenstein. Phone WO 2-8865

North Carolina, Charlotte 9: Tom Brooks, P. O. Box 11421. Phone JA 3-7757

Oklahoma, Oklahoma City 4: L. E. Acker, 1809 W. Main. Phone CE 2-3771

Tennessee, Chattanooga 11: Logan-Moore, Inc., P. O. Box 9146 (East Ridge). Phone MA 4-7328

Tennessee, Knoxville 17: Construction Services Co., P. O. Box 3333. Phone 4-1496

Tennessee, Memphis 4: Lewis Supply Co., P. O. Box 2692. Phone 5-6871

Tennessee, Nashville 3: Builders Specialties Co., 1523 Demonbreun. Phone AL 6-0325

Texas, Fort Worth: Well Machinery & Supply Co., P. O. Box 1659. Phone ED 6-2391

Texas, Houston: See Shreveport, Louisiana

Texas, San Antonio 8: Ace Supply Company, 1111 Austin St. Phone CA 3-4268

### TRUSCON LABORATORIES DIVISION, Devoe & Raynolds Co., Inc., 1700 Caniff Ave., Detroit 12, Mich.

Georgia, Decatur: E. F. Strub, 2800 E. Ponce De Leon. DRake 8-4585

Florida, Jacksonville: W. G. Sammons, 2163 Maney Drive. EXbrook 8-5988

Louisiana, New Orleans: W. M. Brackett, 3408 Purdue Drive (Metairie). VErnon 5-1100

Maryland, Baltimore: Emil Gathmann, 619 W. University Pkwy. BElmont 5-4094

Missouri, Kansas City: B. J. Arnold, 228-34 W. 4th St. VIctor 2-2216

Missouri, St. Louis: H. D. Reddy, 926 Spruce St. CEntral 1-4167

Oklahoma, Oklahoma City: F. C. Burton, 513 NW 32nd St. JA 4-7955

South Carolina, Greenville: E. C. Aiton, 10 Woodland Lane. CHurchill 4-2264

Tennessee, Chattanooga: F. A. Ricketts, 3630 Weldon Drive. MAdison 9-7175

Tennessee, Memphis: Fisher Lime & Cement, Linden Ave. at Walnut. JAckson 6-0211

Texas, Houston: Bissonnet Paint Corp., 2410 Bissonnet St. JAckson 9-3485

### UNION CARBIDE CHEMICALS COMPANY, 270 Park Ave., New York 17, N. Y.

Georgia, Atlanta 9: 1371 Peachtree Street, N.E. TRinity 3-2241

Florida, Miami 43: 6356 Manor Lane. MOhawk 7-5181

Louisiana, New Orleans 19: 4833 Conti Street. JUnter 6-5301

Maryland, Baltimore 1: 210 North Charles Street. SAratoga 7-7365

North Carolina, Charlotte 2: 112 South Tryon Street. FRanklin 5-3383

Oklahoma, Tulsa 24: 2901 South Harvard. RIverside 2-5524

Texas, Dallas 6: 6300 N. Central Expressway. EMerson 8-6301

Texas, Houston 27: 3839 West Alabama Ave. MOhawk 7-5641

### THE WILBUR & WILLIAMS COMPANY, 650 Pleasant Street, Norwood, Mass.

Florida, Tampa: R. A. Lancaster, 4124 Sevilla. Phone 65-5735

Louisiana, New Orleans: V. Kittredge Dell, 6123 Clara Street. UNiversity 6-2341

North Carolina, Asheville: M. R. Kearns, 1215 Haywood Road. ALpine 3-4171

Oklahoma, Oklahoma City: Lewis A. Poynter, 2808 N.W. 44th

Texas, Dallas: John G. Wilsey, 2604 Mt. View Drive. CHapel 7-2457

### WISCONSIN PROTECTIVE COATING CORP., 614 Elizabeth St., Green Bay, Wisc.

D. C., Washington 6: Sexton & Peake Inc., 1025 Connecticut Ave., NW. Phone STerling 3-4463

Florida, St. Augustine: Engineered Products Co., Box 1097. Phone VAlley 9-3653

Louisiana, New Orleans 23: Kitco Co., 344 Tudor St. Phone KEnner 4-3113

Ohio, Hamilton: Jackson Associates Sales, Inc., Box 2001 Fairfield Sta. Phone TWinbrook 5-7602

Oklahoma, Tulsa 3: Engineering Sales Co., 409 N. Cincinnati. Phone LUther 4-4601

Tennessee, Elizabethton: J. P. Fuller, Inc., Box 88, Carter County

Texas, Dallas 35: Paul Simmons Co., 2505 W. Mockingbird Lane. Phone FLeetwood 7-2438

Texas, Houston 27: Plant Specialty Co., Box 22442. Phone MOhawk 5-0223

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SOUTHERN POWER & INDUSTRY
a W.R.C. Smith Publication
806 Peachtree St., N. E., Atlanta 8, Georgia

*Atlanta Airport Lighting Circuits Provide Example of*

# Trouble Shooting with a Ground Detector

**GROUND DETECTORS** are used very generally in industry where grounds must be located quickly, sometimes on circuits which cannot be de-energized. They have proved their worth in many large manufacturing plants, and are sold and serviced by manufacturers' representatives located around the nation.

The Atlanta Municipal Airport recently had a ground, and it was decided to try out the Allen Ground Detector (manufactured by Excel Electric Service Co.) on the runway lighting system to determine its value in locating grounds in the series lighting system.

The airport runway lighting system is a 3-cable series circuit, using 550 volts and a current of 6.6 amperes. At each runway light, there is a small concrete pit, flush with the ground, with the runway light mounted above the pit. The cable for the lighting circuit enters the pit, and passes through the primary of a transformer to the other side of the pit, and on to the next light. This is direct burial cable.

The secondary of the transformer is connected to the lamp. There are three lamps in each light, and there are three separate transformers in the pit.

Since the cable is only buried a foot or two, and since it is not enclosed, the pit collects water during rainstorms, and when these storms are severe or frequent enough to keep the transformers continually submerged in water, trouble is bound to develop and the transformers or other parts of the system will go to ground.

These grounds can be severe enough to blow the protective fuses in the lighting circuits, and in any event they are detrimental to the system operation. So they must be located and removed. The usual method is to de-energize the system, and to open up the cable at various points and check for grounds by ringing out the cable between the points where it is opened up. This takes considerable time, and also has the disadvantage that each time the cable is opened up there is a good chance that an improper insulation closure may cause another ground.

The East-West runway in Atlanta has three cables and three lamps and three transformers in each light installation.

To start the test all three cables were de-energized. Then a source of 220 volt, 60 cycle power was connected to the primary of a 5 kva dry type transformer. The secondary of the transformer was 480 volts, and one side of the secondary was connected to the ground, with the other side connected to one end of one of the runway lighting cables, through the Allen Ground Detector.

The detector was properly grounded for safety and the cable was then checked for ground. This check consisted of energizing the dry type transformer and then pressing the test button on the Allen Ground Detector. If a ground was present, the ammeter needle on the detector indicated current flow. Each cable was checked out individually and the ground was found to be in Cable No. 1.

The Allen Ground Detector was then switched to automatic operation, which allowed current to flow in the cable as a contactor opened and closed. This pulsating current could be picked up by the milliammeter on a hand held detector unit, when it was held close to the cable.

The signal could be traced along the cable until the grounded light was reached. At this point, the signal disappeared and opening the runway light pit enabled the ground to be found—generally in a transformer.

Some grounds were of sufficient severity that a current of 5 or 6 amp would flow. This was sufficient to light the runway lights, which blinked in unison with the pulsating current from the ground detector. In this case, it was a simple matter to proceed along the lighting system to the last light which was blinking, and the ground was at that point.

It is felt that this method offers an easy way to locate grounds — to save time in locating them, and it eliminates the necessity for opening up cable and re-splicing it. The same method of trouble shooting can be employed in most industrial operations.

*By J. H. REID*
*The Gearhart Company*
*Atlanta, Georgia*

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# Vibration Damage To Solenoids

**SOUTHERN** Crate and Veneer Company, Macon, Georgia, manufacturer of wire bound boxes and crates, had experienced premature failure with the solenoid coils on their wire binding machinery.

These coils are called on to operate fifty to sixty times a minute, eight hours a day. After a thorough check of voltage and operating conditions, it was determined that this coil failure was caused by excessive vibration.

The coils were then rewound with General Cable Gentherm magnet wire, and encapsulated with epoxy compound.

To date, the coils rewound with Gentherm magnet wire and encapsulated with epoxy compound have given more than twice the service of the original coils.

*By R. W. WILSON,*
*Wilson Electric Co., Inc.,*
*Macon, Georgia*

# Three Methods of Silica Removal

**AS BOILER PRESSURES** increase with modernization expansion programs, one of the impurities in feedwater that must especially be reduced is silica. This is to protect not only the boilers but also the turbines from silica deposits. Such deposits cause drop in turbine efficiency and costly outages for cleaning. To prevent such deposits, boiler steam must not contain silica over 0.02 to 0.03 ppm. This can only be obtained by low silica in the boiler water (concentrated saline).

Table I shows the silica limits in boiler water for various pressures and allowable silica in feedwater for reasonable boiler blow off.

**By S. B. APPLEBAUM**

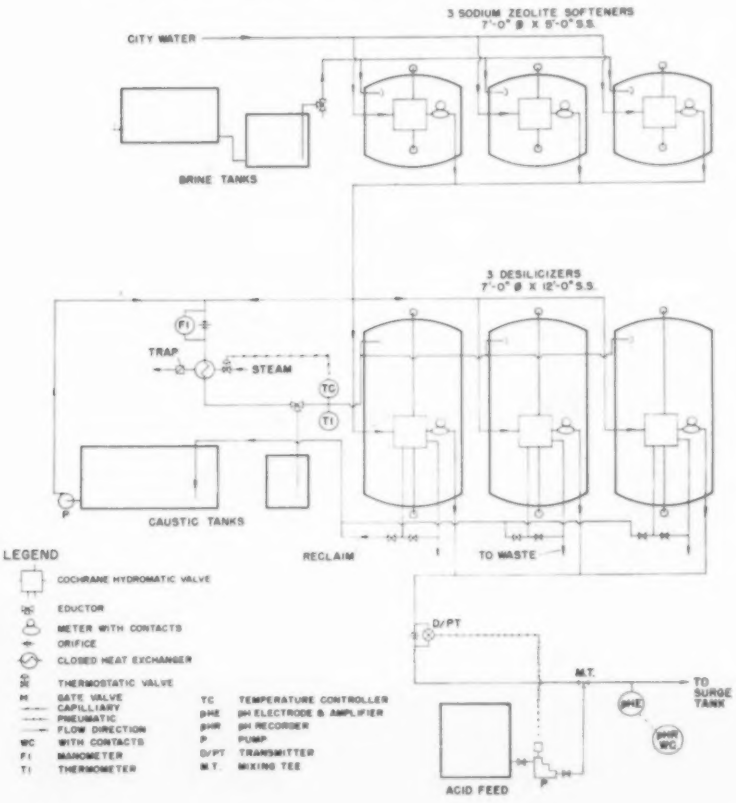
**Director, Water Treatment Division**
**Cochrane Corporation**

### Methods of Silica Removal

Three methods are available:

1) Hot Lime Zeolite—This reduces silica in make-up to about 0.5 to 1.0 ppm.
2) Desilicizer — This reduces silica to 0.1 to 0.5 ppm. It is a compromise between hot lime zeolite and demineralization.
3) Demineralizer — This not only reduces silica to under 0.01 to 0.02 ppm but reduces all the other dissolved solids to trace amounts.

Fig. 1. Sodium Zeolite and Desilicizer, 300,000 Lb/Hr.




For boiler pressures reaching 1000 to 1500 psig, investment and operating costs must be compared to determine which method to use.

Hot lime zeolite usually results in the lowest operating cost, especially when the raw water is not entirely clear. Desilicizers or demineralizers require pre-treatment clarification equipment to prevent fouling of the resin. Hot lime zeolite can handle such waters successfully without pre-treatment in most cases.

Desilicizers are particularly economical if the raw water is fairly low in solids but high in silica content. Lowest investment results if sodium zeolite softeners are already in use because then it is necessary to add only the unlined anion salt splitter units.

However, when boiler pressure exceeds 1000 to 1500 psi, the trend is definitely toward demineralization.

In many plants, there is a considerable prior investment tied up in existing water treating equipment. In planning an expansion program, the plant engineer is faced with using existing parts as much as possible to keep investment down and yet obtain the higher feedwater quality required.

The following examples show the reasons which dictated selection of Hot Lime Zeolite, Desilicizer and Demineralizer, respectively, in three typical case histories:

### CASE 1 — Hot Lime Zeolite

This larger paper company had installed a hot lime soda plant 20 years ago to treat 160,000 pounds per hour of make-up. When they expanded in 1945, a second sedimentation tank was added to follow the existing one, for adding phosphate to reduce hardness to almost zero. In 1959, a modernization program required a make-up of up to 450,000 pounds/hour.

Several possibilities were considered:

a) Discontinue the hot process and install a demineralizer for 450,000 lb/hr.

b) Continue the hot process and install a demineralizer for 150,000 lb/hr.

c) Change the existing hot process to hot lime zeolite.

Possibility (c) was adopted because of lowest costs required. Phosphate was discontinued and the second sedimentation tank, previously in series, was put in parallel with the first tank. This increased settling capacity and only additional filters and Hot Zeolite units were needed.

Table II gives comparative operating and equipment costs:

### Sodium Zeolite and Desilicizer

Demineralization is a two step process:

a) In the first step, cation resin exchanges cations for hydrogen, thus converting salts to their corresponding acids.

b) In the second step, these acids are exchanged for hydroxides by anion resin, thus converting acids to pure $H_2O$.

In the Cochrane desilicizer process, the strongly basic anion resins split the salts directly, exchanging anions for hydroxide without going through an acid regenerated cation resin first step. Thus, all the salts including silica are converted to sodium hydroxide. Part of this hydroxide can be neutralized by acid if desired.

Desilicizers reduce silica down to 0.1 to 0.5 ppm with less caustic soda for regeneration than required for demineralization. Therefore, the operating cost is lower. Furthermore, the equipment is less expensive because it is not necessary to use rubber lined piping, valves and shells, as with demineralization. All that is required is to soften the water through cold sodium zeolite and then pass the soft water through unlined anion units. The following case history shows why this desilicizer process was selected:

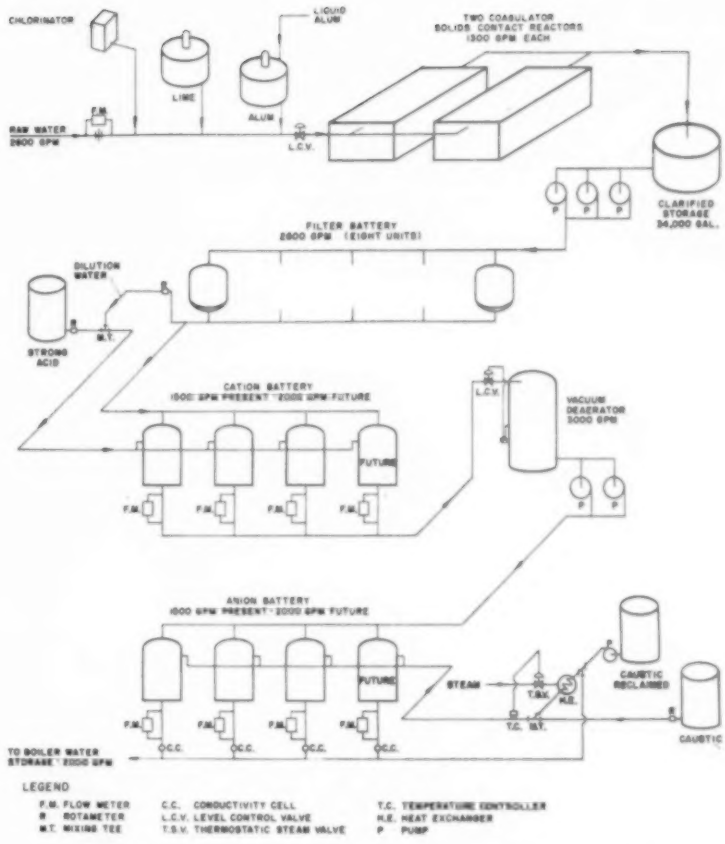



Fig. 2. Clarification and Demineralizer, 750,000 Lb/Hr.

The desilicizer was selected in this case because:

1) Lowest total investment, including field erection of sedimentation tank, insulation, steam and other piping, etc.

2) Saving of space.

3) Simplicity of operation — no chemical feeds.

4) Capable of handling extremely variable loads prevalent in this plant. With hot process, there was danger of sludge carryover from the sedimentation tank with these violent flow variations.

5) Lower silica than hot process, also much lower $CO_2$ in steam.

The paperboard mill operator is very well satisfied with the simplicity of operation of the desilicizer compared to his previous hot process which involved controlling addition of several chemicals to properly precipitate and settle the impurities. Now no precipitates are formed. The reactions take

## CASE 2

This paperboard plant located in Georgia has boilers of 600 psi pressure with a make-up of 33%. However, the water treatment plant installed has a capacity of 300,000 lb/hr for up to 50% make-up.

About ten years ago, this plant installed a hot process softener in which the hardness was removed by phosphate and caustic soda and silica reduced by magnesium salts.

In 1957, the plant became too small for its requirements and the sedimentation tank had become damaged so that a new tank would have been required to continue hot process.

Several possible systems were considered: 1) New Hot Lime Zeolite, 2) Demineralizer, 3) Cold Sodium Zeolite Softening Plant followed by a Desilicizer.

Table III gives the comparative equipment and chemical operating costs. Figure I shows the flow diagram of the desilicizer installed.

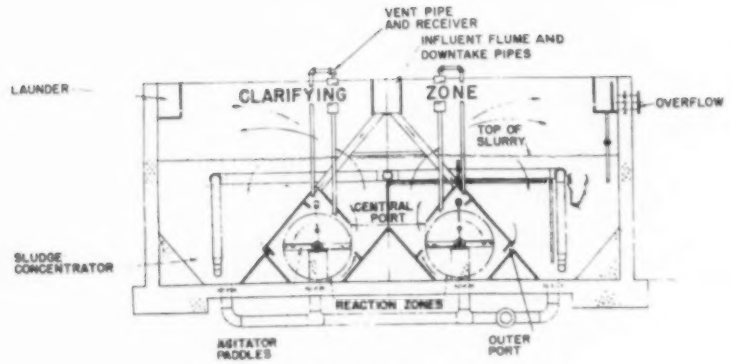



Fig. 3. Rectangular Type Reactor.

place by ion exchange which has the great virtue of being automatic in its chemistry, avoiding over or under treatment.

### CASE 3 — Two Bed

This case in which a demineralizer was selected was a large pulp mill in North Carolina. The water available is a polluted river supply. Make-up is 40% but when the condensate becomes contaminated, it rises to 100%. Boiler pressure at present is 650 psi, but plans are made to put in 1900 psi boilers for topping turbines in the future.

When an expansion program came up recently, hot lime zeolite and demineralization were compared and Table IV gives investment and operating costs. Demineralization was selected because of the very low solids and silica it would produce to take care of the future 1900 psi boilers.

Figure 2 is a flow diagram of the clarification and demineralization plant installed. The demineralizer has a capacity of 750,000 lb/hr with room provided to add more units to increase capacity to 1,000,000 lb/hr (2000 gpm).

The river water being difficult to coagulate, a modern pretreatment clarification plant is included. This consists of two rectangular coagulating solids-contact reactors, each 25' wide by 52' long by 13' high. Figure 3 (elevation) indicates baffles and agitators. Chemical feeds are provided for chlorine, lime, alum and coagulant aid. Suspended sludge is maintained in the lower zone.

The water, after passing through this reaction zone, flows through the central port and then laterally over to the effluent launders. Contact with the suspended sludge has a catalytic effect, producing excellent coagulation with a minimum of chemical and retention time.

The coagulated water from the reactors is pumped through eight pressure filters, 11'-0" diameter into a battery of three cation units, 11' - 0" diameter, and then into a vacuum deaerator for removal of $CO_2$ and oxygen. From there, it is pumped through a battery of three anion units, 11' - 0" diameter to service.

The operation of the demineralizer is fully automatic. Instead of a valve nest with much pneumatic tubing, a Cochrane hydromatic single control valve is provided on each cation and anion unit. These hydromatic valves are entirely rubber lined to withstand acid water. Inside the body are six diaphragm valves, hydraulically operated by a small motor driven pilot valve on the front of the valve.

A 16 watt motor operates the pilot valve which in turn automatically opens and closes the correct internal diaphragm valves required for regeneration. The cation and anion units are regenerated not more than once a day at full load.

Regeneration employs sulfuric acid and liquid caustic soda. The regenerants flow into measuring tanks from which submerged vertical centrifugal pumps discharge them into mixing tees where they are diluted in-line.

This is a large, modern, fully automatic demineralizer containing the latest design features. One of these features is the flat bottom for cation and anion units, reinforced by outside steel beams without any anthracite sub-fill to support the resin. This avoids long rinsing.

The underdrains consist of header and laterals at right angles with even spacing of orifices in these laterals. This insures uniform water distribution to prevent channeling and premature breakthrough of impurities. Thus the utmost purity of final effluent is obtained at all times. The laterals are covered by screening to prevent escape of resin.

The guaranteed results are:

1) Turbidity from the reactors not to exceed 10 ppm.
2) Soluble silica in the demineralized effluent under 0.05 ppm.
3) Total dissolved solids 2 ppm.
4) Conductivity 10 mmhos, or 100,000 ohms resistance.
5) Dissolved oxygen 0.1 ppm.

This quality of effluent is entirely suitable, after subsequent deaeration, for the future 1900 psi boilers.

### Demineralizer Types

Instead of the two bed demineralizer just described, more complex systems are used for greater economy or still higher effluent purity, such as three bed and multi-stage.

### Three Bed Systems

The three bed system consists of a cation bed, a weak base anion bed and a strong base anion bed. The weak base bed removes sulphates and chlorides more economically than the strong base anion resin which is used for $CO_2$ and silica removal alone.

Caustic soda regenerant is first passed through the strong base anion resin beds and from there through the weak base anion beds. Thus the caustic soda does double duty. Where the sulphates and chlorides in the water are sufficiently high, this three bed system saves considerable caustic soda and reduces operating cost appreciably.

A typical plant is an oil refinery in Texas, treating up to 1,250,000 lb/hr by such a three bed system, consisting of four trains in parallel, each train containing a cation,

weak base and strong base anion units (units 11' - 6" dia.). The demineralizer is fully automatic and has been in successful operation for several years.

Decarbonation can be omitted with such three bed systems, if the alkalinity is low enough, because the strong base resin can remove both $CO_2$ and silica with almost the same amount of caustic soda as required for the weak base anion regeneration.

### Multi-Stage Demineralizers

In central stations, more elaborate make-up demineralizers are installed, when boiler pressure exceeds about 2000 psig. These may consist of:

1) Four Bed Systems - or two Two Bed Systems in series — primary and secondary.
2) Mixed Bed Primary Systems alone.
3) Two Bed Primary with Mixed Bed Secondary.

TABLE I — SILICA TOLERANCE VS. BOILER PRESSURE

To Produce Steam Containing Less Than 0.02 to 0.03 ppm $SiO_2$

| Boiler Pr. Psig | Ppm Silica in Boiler Saline | Ppm Silica in F. W. For 5% Blow Off |
|---|---|---|
| 600 | 35 to 50 | 1.5 to 2.5 |
| 700 | 25 to 35 | 1.0 to 1.8 |
| 800 | 15 to 25 | 0.8 to 1.0 |
| 900 | 8 to 10 | 0.4 to 0.5 |
| 1000 | 5 to 8 | 0.3 to 0.4 |
| 1250 | 3 to 5 | 0.2 to 0.3 |
| 1500 | 2 to 3 | 0.1 to 0.2 |
| 2000 | 0.8 to 1.2 | 0.04 to 0.06 |

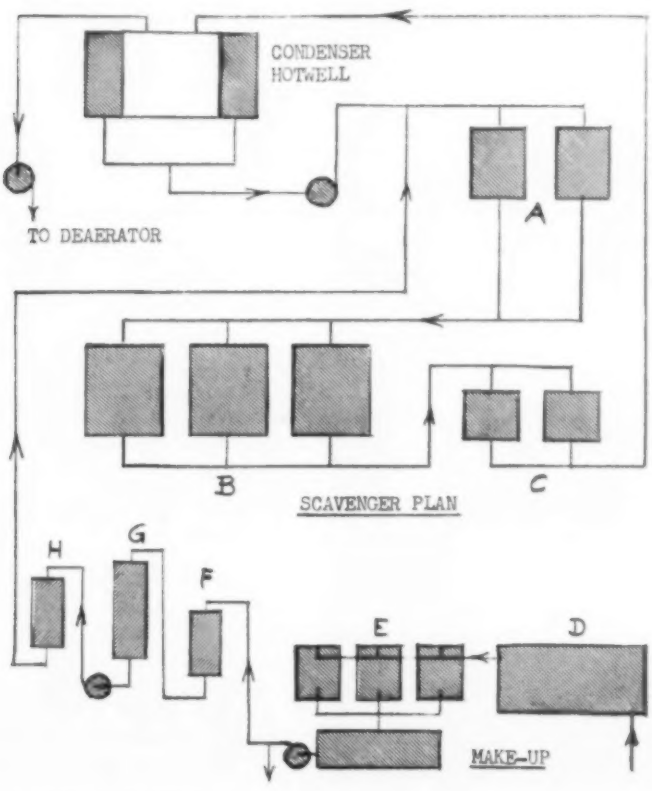
TABLE II — HOT LIME ZEOLITE

Equipment Costs and Operating Costs

| Equipment Costs | Dollars |
|---|---|
| 1) Complete Demineralizer — 450,000 lb/hr | 250,000 |
| 2) Partial Demineralizer — 150,000 lb/hr | 120,000 |
| 3) Four Hot Zeolite Units and One Filter, etc. to supplement existing Hot Process Equip. | 57,000 |

| Operating Costs (Chemicals) | Cents/1000 gal |
|---|---|
| 1) Demineralizing (acid and caustic) | 12.6 |
| 2) Hot Lime Zeolite (lime and salt) | 1.8 |

Fig. 4. Flow Diagram of Scavenger and Make-Up Treatment. Legend: A — Prefilters, B — Mixed Bed Units, C — Post Filters, D — Solids Contact Reactor, E — Gravity Filters & Clearwell, F — Cation, G — Vacuum Deaerator, H — Anion.




The trend is towards the third system. It will produce treated water of the following purity, depending on raw water composition and regenerant dosage: Soluble Silica, as $SiO_2$ = 0.01 to 0.02 ppm; Total Dissolved Solids (TDS) = 0.05 to 0.25 ppm; Conductivity = 0.125 to 0.63 mmhos; Resistivity = 1,600,000 to 8,000,000 ohms/cm.

Mixed bed primary systems should be used only on ground water, free from organic matter, because anion resin is more vulnerable to organic fouling when in primary mixed bed units than in primary two bed plants.

A number of central stations had difficulties with primary mixed bed units even on city waters which came from river supplies but were well clarified in municipal filter plants. Enough residual dissolved organic matter still remained in the city water to cause fouling of the anion resin, which reduced capacity and effluent quality. Several stations finally installed a primary two bed plant to precede the existing mixed bed units which were then used as secondary or polishing units only. This solved the organic fouling problem.

In multi-stage systems, it is possible to use smaller units in the

secondary stage at rates of 25 gpm/sq ft or higher, because they have so little work to do. This reduces first cost.

### Scavenger Condensate Units

In once-through drumless boilers, feedwater enters the boiler tubes at one end and steam leaves at the other end. Any impurities in the feedwater are, therefore, crystallized out in the boiler tubes or are carried over with the steam to deposit in the turbines. The tolerances of feedwater impurity therefore became more stringent, expressing them in parts per billion instead of parts per million.

A new concept of water treatment then became necessary — to treat the feedwater rather than to treat the 1% - 2% make-up alone. This led to the development of scavenger condensate demineralization.

Three central super-critical pressure (over 3206 psia) drumless boilers have thus far been installed:

1) American Electric Power Service Corporation, Philo Station — 125,000 kw, 725,000 lb/hr of steam at 4500 psig and 1150 F.
2) Philadelphia Electric Company, Eddystone #1 Unit — 325,000 kw, 2,000,000 lb/hr of steam at 5015 psia at 1200 F.
3) Cleveland Electric Illuminating Company, Avon Plant #8 — 250,000 kw, 1,250,000 lb/hr of steam at 3500 psig, 1100 F.

Table V gives the limits of impurities at each of these plants for their feedwater.

Typical of the scavenger plants is the installation at Avon. The scavenger plant consists of cellulose precoated, tubular septum filters, followed by mixed bed demineralizers. They are designed to handle, normally, 50% of the total condensate flow, or 1250 gpm; but in emergencies, if a condenser tube ruptures, they can handle the whole flow, or 2500 gpm. Cartridge post filters follow the demineralizers.

Three demineralizer units, 10'-6" diameter operate at a rate of about 15 gpm/sq ft when 2500 gpm passes through two of these units.

The make-up is from Lake Erie and a 200 gpm complete pretreatment plant is installed including a Cochrane Rectangular Solids-Contact Reactor and gravity filters for lime, alum coagulation and clarification. This is followed by a make-up two bed demineralizer (with vaccum deaerator) which discharges its effluent into the scavenger mixed bed demineralizer inlet for polishing with the condensate.

Figure 4 is a simplified flow diagram of the scavenger and make-up plant.

**TABLE III — DESILICIZER**

**Equipment Costs and Chemical Operating Costs**

| Equipment Costs (not erected) | Dollars |
|---|---|
| 1) Hot Lime Zeolite (K.D.) | 80,000 |
| 2) Demineralizer | 102,000 |
| 3) Cold Zeolite and Desilicizer | 72,000 |

| Chemical Operating Costs | Cents/1000 gal |
|---|---|
| 1) Hot Lime Zeolite lime, salt and magnesium oxide | 4.5 |
| 2) Demineralizer — acid and caustic soda | 10.6 |
| 3) Cold Zeolite and Desilicizer salt, caustic soda, small amount of $H_2PO_4$ | 7.7 |

**TABLE IV — DEMINERALIZER**

**Comparative Equipment Costs and Chemical Operating Costs**

| Equipment Costs (not erected) | Dollars |
|---|---|
| Hot Lime Zeolite | 225,000 |
| Clarification and Demineralizer | 310,000 |

| Chemical Operating Costs | Cents/1000 gal |
|---|---|
| Hot Lime Zeolite (dolomitic lime, magnesium oxide, gypsum and salt) | 6.3 |
| Demineralizer (alum, lime, acid and caustic) | 5.95 |

**TABLE V — Tolerances of Impurities in Feedwater for Supercritical Pressure Boilers in Parts Per Million (ppb)**

| | Philo | Eddystone | Avon |
|---|---|---|---|
| T. D. S. | 150 | 50 | 50 |
| $SiO_2$ | 16 | 5 | 20 |
| Fe | 7 | | 10 |
| Cu | 8 | | 10 |
| $O_2$ | 3 | | 7 |
| pH | 9.3 to 9.6 | | 9.0 to 9.5 |

**TABLE VI — Solids Added to Feedwater by Condenser Leakage**

| Condenser Leakage % | Water Leakage pounds/hour | Solids Added to Feedwater lb/hour | lb/yr |
|---|---|---|---|
| 0.005 | 50 | 0.515 | 131 |
| 0.025 | 250 | 0.075 | 655 |
| 0.050 | 500 | 0.150 | 1310 |
| 0.500 | 5000 | 1.500 | 13100 |

Based on one million lb/hour condensate flow, with 300 ppm total solids in condenser cooling water

### Sub-Critical Pressure

The adoption of the scavenger system by supercritical plants has raised the question of its applicability to high pressure but still sub-critical drum type boiler plants. The evidence points to this as the next change now being

adopted (Ref. #1).

First, there is the paper (Ref. #2) describing a survey of eight central stations in the 1800 to 2400 psig range. The authors (General Electric Company's engineers) studied the effects of turbine deposits on turbine efficiency. They found that turbines in the 1450 psig class have not as a rule suffered from loss of efficiency due to such deposits. However, in the 1800 to 2400 psig range, deposits caused a 3% loss in the high pressure section and a 1.5% loss in the intermediate pressure section.

Result is a 1% loss in overall heat rate worth $34,000 per year on a 200,000 kw machine, with 80% load factor and 30 cent fuel. The authors estimate deposit free turbine operation would be worth $20,000,000 a year to the utility industry. This is based on 600 billion kwh generated in 1956 and 1% heat loss rate.

When central stations went to 1800 psig from their previous 1450 psig level, they expected a heat rate gain of 1.8%. This survey indicates that more than one-half of this expected gain has been lost by turbine deposits.

Such turbine deposits point to the need of better feedwater treatment than the conventional method of demineralizing only the 1%-2% make-up, plus supplementary treatment with chemicals such as phosphate, hydrazine, and ammonia. Condenser leakage can add a considerable amount of solids to the feedwater. Table VI shows this.

In addition, corrosion of preboiler system brings in significant amounts of corrosion products despite the use of inhibitor supplementary chemicals.

The only real solution is the scavenger condensate demineralizer preceded by septum filters to treat all the condensate. To reduce their first cost, such demineralizers can be designed to operate at higher rates, of 30 gpm/sq ft and over.

**REFERENCES**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2) Angelo, J. and Cotton, K. C. — "Observed Effects of Deposits on Steam Turbine Efficiency"— ASME Annual Meeting, N. Y. City—December 4, 1957—ASME Paper No. 57-A-116.


# Portable Pump Spots Leaks for St. Louis Refinery

**A PORTABLE** pump rig which speeds up hydrostatic testing of valves and other equipment has been built by the maintenance staff at the East St. Louis refinery of Mobil Oil Company. The unit is used throughout the refinery, wherever water and air connections are available.

The portable hydrostatic test unit consists of a horizontal air-operated hydro-pneumatic pump with a rated capacity of 7,330 psi, which is mounted on a rubber-tired cart. This pump, made by Aldrich Pump Company, supplies hydrostatic pressures ranging from 250 lb to 2,500 lb. Operated by plant air at 90 psi the pump works quietly without vibration.

The portable pump is used mainly at "turn-around" time when refinery units are dismantled, inspected, and restored to optimum working order. Many valves are inspected, rebuilt if necessary, and then tested for leaks under hydrostatic pressure. Relief valves, in addition, are hydrostatically tested for correct operation.

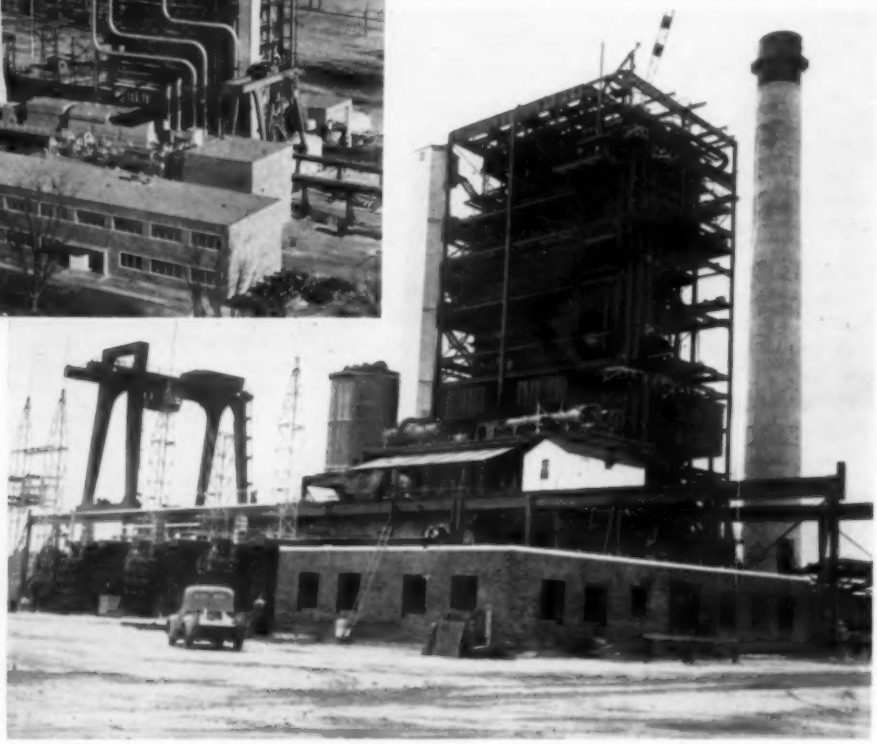
In the valve repair shop, the portable pump is connected to a test stand on which the valves are mounted. Hydrostatic pressures ranging from 125 to 250 psi are then created. This enables the maintenance staff to spot leaks instantly and also adjust relief valve springs to precision settings for specific design pressures.

The portable pump is also used for hydrostatic testing of heat exchangers before they are returned to service. Without disturbing piping arrangements, the unit quickly supplies hydrostatic pressure to meet Mobil's test specifications — such as holding 500 psi for one-half hour.

A major benefit provided by the portable pump is fast operation. Since it is air-operated, pressure is built up to the required level in only seconds. When a number of valves are to be tested, this means a tremendous increase in speed over hand pumping and a great saving in testing time.

LEFT—Louisiana Power & Light Company's Sterlington Station, showing the windowless, air conditioned control building at the head of the turbine-generator platform between the boiler and office building. The Operational Information System is on the third floor.

BELOW—Carolina Power and Light Company's Darlington Station near Hartsville, South Carolina, includes an Operational System with limited control.



**By C. E. JONES**

General Manager
Control Systems Div.
Daystrom, Incorporated

### Southern Utilities in Forefront of Trend Toward Automation

# Computers - - and More Computers

**ELECTRIC** power utilities, serving the South and Southeast, are now in the forefront of the nation's users of electronic computer control of their processes.

Two Operational Information Systems, computer-directed, have been shipped to the Carolina Power and Light Company at Darlington, South Carolina, and the Gulf States Utilities Company at St. Gabriel, Louisiana.

They recently went on-line, joining a similar system in use for the last two years at the Sterlington plant of The Louisiana Power and Light Company, which early in 1961 will put a completely automated station into service at Little Gypsy, Louisiana. Another information system for the Kansas Gas & Electric Company at Wichita, Kansas, will join these three before the end of the year.

ABOVE—Daystrom Operational Information System installed at Gulf States Utilities, Willow Glen Station, St. Gabriel, Louisiana. Shown are: The logging console with two log typewriters; operator's console with keyboard, display panel and recorder typewriter, and computer cabinets on the right.

RIGHT—Information System computer cabinets installed at the Louisiana Power & Light Company's Sterlington Station. Cabinets contain the logic circuitry, magnetic core memory unit, solid-state power supplies, Daystrom analog-to-digital integrating translator, and input terminal boards.

All the Information Systems are identical in function. They are designed to provide human operators of a station with all the data that they require for its most efficient operation and, at the same time, do all essential computations required for decision-making.

To execute that job, they will monitor approximately 400 critical points throughout each station. They will scan them for temperatures, pressures and flows at the rate of 5 points per second.

The electronic computer control system at Little Gypsy goes several steps beyond the Operational Information System. It will supervise the plant's operation from start-up, through operation to shut down.

On a signal of any predetermined nature, the computer will start the fire under the boiler. It will start the feedwater pumps and will see that water is pumped into the boiler to the required level, meanwhile checking the oiling of the feedwater pumps.

It will start the turbines rotating electrically; it will check all of the oil bearing pressures; eventually admit steam to the turbines and start the generators operating under steam power, and, after everything is in proper operating condition, will throw the "on-line" in phase.

Toward the final steps of the start-up process, the computer will monitor as many as 640 switch positions in one-half of a second before proceeding to throw the equipment on-line.

In doing this, it will go through 420 different steps. In taking each step it will say, "Did I do that correctly?" and will make a check. It will also check each step to see whether the new step is operating in proper function with the preceding steps. If it finds anything wrong and has been programmed to make a decision, it will make a correction. If not, it will go back, shut off a certain number of steps and alert plant personnel to the difficulty.

Concurrently, the computer will have determined what the trouble is, where it is, and will type this information out on a piece of paper so that servicemen can look at the piece of paper and determine the general source of trouble. Through knowledge of logical design and aided by test programs, the difficulties can be quickly located and repaired.

Operating experience indicates that over 90 per cent of maintenance problems are found to be in peripheral equipment; thus routine checks on these units can substantially eliminate system down time. Minor difficulties are easily taken care of by plant operators; more extensive repairs are handled by local area representatives or by phone directions from the main laboratory in California.

Early realization by the South's electric industries of the impending necessity for automation spearheaded studies of how and where to begin preparation.

The Louisiana Power & Light Company decided that two steps were necessary: gathering of operating, performance and historical data; then, adding control functions based on the information received in the first step.

The knowledge gained by their personnel and Control System's engineers since the Sterlington installation, coupled with proven equipment reliability, shortened the original time schedule, thereby allowing the first completely automatic computer control to appear in the Southern area.

# How to Keep Fasteners Tight • • • •

By FRANCIS R. KULL
Project Engineer
Standard Pressed Steel Company

**A SIMPLE** one-two approach can solve most fastener failure problems. It consists of (1) taking steps to insure that threaded fasteners are tight enough to begin with, and; (2) making use of the added protection of self-locking fasteners, where shock and vibration conditions exist.

### The Tightening Problem

Getting the fastener tight in the first place is the initial problem, and the main key to prevention of loosening and fatigue-induced failures.

Fatigue cracks and the resultant structural failures are the major enemy of any fastener subject to even mild dynamic loading, which means most fasteners. Like loosening, such failures also result from repeated stressing of the fastener — the dynamic loading which causes failure at stress levels far below the material's yield strength. Bolts made tighter than the working load, and kept tight, cannot fail. This is why the man with the wrench, far more than the designer or the metallurgist, is the most important factor affecting fastener performance.

The moral, then, is to cinch down the fastener tightly so that the preload (the clamping force due to the induced load of tightening) will exceed the working load.

With conventional torque-wrench installation, tightening to about 65 per cent of yield strength is a desirable goal in general applications, and even higher in more closely controlled applications.

But, remember, the yield strength in tightening is less than the yield strength in straight tension. Because of the added stress or torquing, it may be only 50 per cent to 90 per cent of pure tensile yield. It's a matter of the friction between the mating threads, which, in turn, depends upon material and lubrication. In general, lubricants make it practical to tighten fasteners more securely.

Substitution of higher-strength fasteners in troublesome applications is another good bet. These will permit greater tightening without fear of fastener damage.

### Keeping Tab on Preload

How can you measure the preload of tightening? The commonest way is by measuring and controlling the torque producing the tightening. It's a good idea, then, if you're having trouble, to start using either the manual torque wrench or pre-set friction pneumatic and electric tools of the type used on assembly lines.

A shortcoming of torque wrenches is that, while they are themselves accurate to plus or minus 2 per cent, friction causes an inherent scatter in results. Errors of as much as 30 per cent or more are sometimes the result.

Tightening with lubricants like lube oils, anti-seize compounds, phosphate coatings, or electroplated deposits reduces this scatter effect. Washing screws and bolts before use tends to reduce preload and promote inconsistency in tightening, unless new lubricant is applied after cleaning.

### Good Rule-of-Thumb

As a simple guide where no torque measuring device at all is used, the average man can pull about 100 lb at the end of a wrench. Multiply this by the length of the wrenching lever arm in inches to get applied torque in inch-pounds.

In tightening, don't worry too much about overdoing it. The big problem, experience has shown, is insufficient tightening, not overtightening. If a bolt keeps loosening, tighten right up to the yield strength if necessary until it stops loosening.

But once tightened, will the fastener stay tight?

Proper tightening in the first place helps insure continued tightness, by boosting friction and the

Maintenance man tightens self-locking, one-piece locknuts, which greatly reduced the problem of holding nuts tight under shock and vibration.

grip of the threads. But relaxation, changes in temperature, vibration, any movement of parts fastened will ultimately contribute to screws working loose. Thus, on critical fasteners, lockwires, cotter pins, or similar positive locking means are often used. Nuts are often tightened and then backed off slightly to match openings with the wires. This reduces part of the initial preload to begin with.

Lockwashers can be used, but will probably score the bearing area. Also, they lose effectiveness the moment they are not fully tight.

Tack-welding, keying, and cementing are other methods, but are of course useful only where future disassembly is not needed.

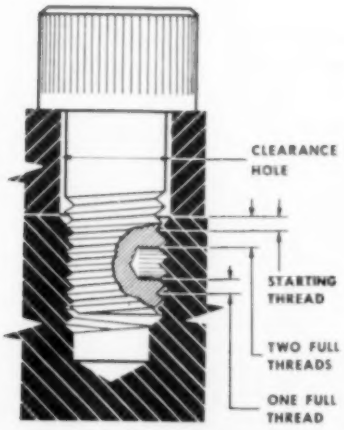
### Self-Locking

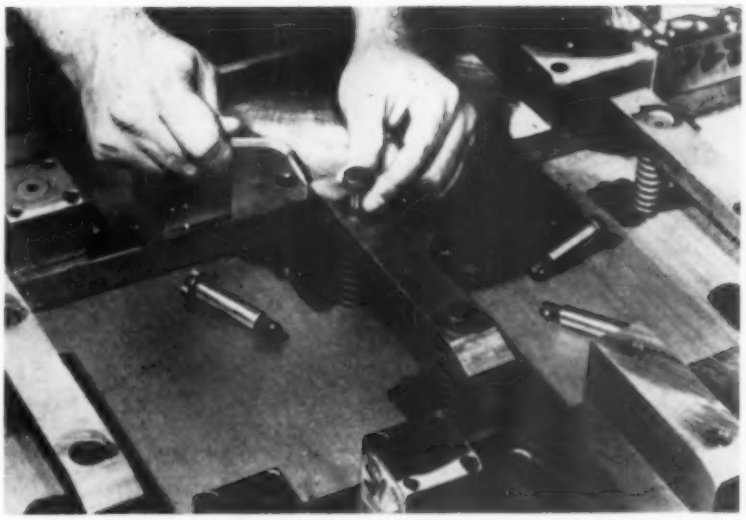
Use of self-locking screws and locknuts is a simple and highly satisfactory answer. One-piece self-locking screws, particularly, are helping solve a number of maintenance headaches with fasteners used in machinery and equipment. These are as standard and as easy to install as the fastener without any locking feature — and they cost less than 20 per cent more.

One type of these standard, self-locking screws (called Nylok) has been made generally available only within the past five or six years. It makes use of a compressible nylon pellet to assure positive holding power. The pellet seats in a small recess near the fastener point, and compresses as the screw is inserted into a tapped hole or nut. This forces mating threads together for positive gripping. They are made in virtually all standard industrial bolt types and by a number of different manufacturers.

These fasteners are reusable repeatedly and stay locked at any depth and need not be seated.

Construction of a cap screw with self-locking (Nylok) feature.



Increasingly specified for tool and die and machinery applications are self-locking fasteners like these shoulder screws with Nylok (nylon) pellet. Fasteners stay tight under severe shock and vibration.

### Week-End Maintenance

An equipment manufacturer found self-locking screws and locknuts the solution to a costly maintenance problem.

The difficulty was in keeping fasteners tight on heavy, 500 and 1,000 ton capacity presses used for blanking, piercing and forming of steel plate up to ½ inch in thickness. Shock and vibration continually loosened the fasteners to such extent that week-end retightening became accepted routine. Two men worked week-ends, three hours apiece, at Saturday time-and-a-half rates.

When the presses had to be shut down during production runs for retightening, it was an additional cost in downtime.

Self-locking cap screws were installed in place of conventional fasteners securing gib plates to the ways — and cut the maintenance problem 90 per cent on the 1,000-ton press. Once every five months is now the retightening schedule. On the older 500-ton press, with stretched threads in the tapped holes, tightening was reduced to once every four weeks.

At the same time, the company substituted self-locking nuts on the studs securing the bolting ring of the ram on the 500-ton press. The self-locking nuts, they report, stood up much better under the vibration and shock than the original nuts.

Literally dozens of other firms have adopted self-locking nuts and screws for applications in everything from instruments to giant machinery. Payoffs cited are reduced need for maintenance attention, reduced machine downtime for tightening, and tighter, better-running and more reliable equipment where vibration and shock are encountered.

With proper attention to the "one-two" of proper tightening of threaded fasteners in the first place — (1) to achieve sufficient preload, and (2) to use self-locking screws or self-locking nuts in shock and vibration applications— any plant can eliminate the majority of its fastener maintenance problems.

# Centrifugal Pump Clinic

**QUESTIONS and ANSWERS**
**Conducted for SPI Readers**

By **IGOR J. KARASSIK**
Consulting Engineer and
Manager of Planning
Harrison Division
Worthington Corporation

## QUESTION . . . . . .

**IN LOOKING** at your "Centrifugal Pump Clinic" in the February issue of Southern Power and Industry, I find that you have overlooked a very basic concept in the design of bolted structures. You state: "When the pump is operating, the internal pressure increases and so does the bolt stress, so that the bolts increase in length." If the pump were designed properly in the first place, neither the bolt stress would increase nor would the bolts increase in length.

You are saying that a bolt must elongate in a bolted structure or a member before the member can take a load and nothing is further from the truth. There is absolutely no elongation in the bolts nor an increase in stress until the initial tension caused by tightening is exceeded, and this would never occur on a properly designed pump. (A. W. A.)

## ANSWER . . . . . .

**I REGRET** that I have to disagree completely with A. W. A.'s comments. When a pump casing becomes subjected to internal pressure, the stress in the bolting which holds the two halves together *does* increase, the bolts *do* elongate ever so slightly and these two facts are in no way an indication of an improper design.

At the risk of touching on some quite fundamental facts of strength of materials and of machine design, I shall demonstrate the truth of these statements. Let us consider a much simplified casing such as shown on Fig. 1. A gasket is placed between the flanges of the two casing halves.

To further simplify our analysis it is assumed that the casing is infinite in length and that we are to examine the conditions that exist in a one-foot length of this casing. Two steel bolts are located on each side of this one-foot casing.

The bolts are tightened until a pressure at least equal to the ultimate internal pressure is developed over the gasket surface. If the gasket were not squeezed to that extent, leakage would obviously take place once the internal pressure was applied, relieving the initial gasket stress. Therefore, the total load on the flange bolts must be at least equal to the total load of the internal pressure acting on the "active" surface of the casing and casing flanges.

We may assume that this active surface is equivalent to the projected casing area between the centerlines of the bolts. (In the case assumed on Fig. 1, this would be the distance of 30 inches between the bolts times the 12 inches of our one-foot long casing, or 360 sq in.)

If the maximum internal pres-

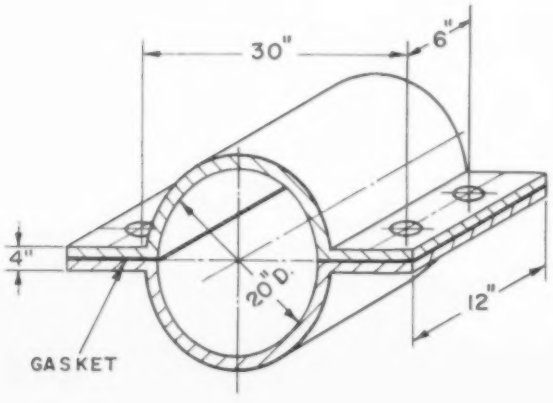



Fig. 1. Simplified drawing of casing and bolts

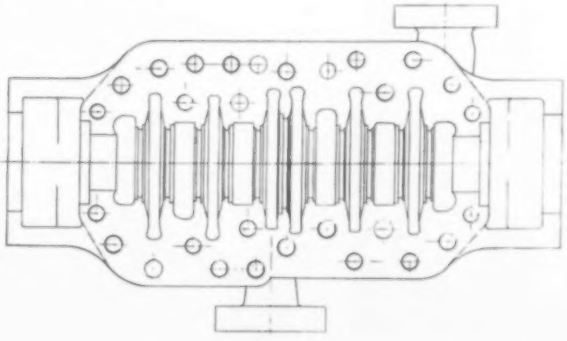


Fig. 2. Multistage pump casing

sure that is to be imposed on this casing is 250 psi, the total load on the "active" surface will be 90,000 lb. This is also the minimum load that must be imposed on the four flange bolts, each of which must be subjected to a load of at least 22,500 lb. To be on the safe side, the tightening load may be increased to 30,000 lb per bolt.

Let us assume that each bolt has a cross-section of 2 sq in. The initial bolt stress will be 15,000 psi.

When internal pressure is applied a load is imposed on the casing flanges which tends to separate them. This load, in turn, is transmitted to the bolts and the stress in the bolts caused by tightening them is increased.

The final stress in the bolts is therefore equal to the sum of the initial tightening stress and that caused by the load. With each bolt subjected to a 22,500 lb load caused by the 250 psi internal pressure, the additional stress is 22,500 lb divided by 2 sq in., or 11,250 psi. The final bolt stress is therefore 26,250 psi.

We can now calculate the elongation to which the bolts shall be subjected by the application of the internal pressure. (Of course, the bolts have already been stretched during the tightening process, since for an elastic material any stress will carry with it a definite strain, or elongation.) As long as stresses stay within the yield strength of the material in question, stress and strain are linked by a relation with the modulus of elasticity of the material. We can list the following relations:

$$\text{Unit Stress} = \frac{\text{Load}}{\text{Area}} = \frac{F}{A}$$

$$\text{Unit Strain} = \frac{\text{Elongation}}{\text{Initial Length}} = \frac{e}{L}$$

$$\text{Modulus of Elasticity } (E) = \frac{\text{Unit Stress}}{\text{Unit Strain}} = \frac{F}{A} \times \frac{L}{e}$$

$$\text{Solving, we get: } e = \frac{F \times L}{A \times E}$$

If the flanges are 4 inches thick and if we assume that the modulus of elasticity of steel is $30 \times 10^6$, we can solve equation (4) for the elongation under the additional load of the internal pressure:

$$e = \frac{22{,}500 \text{ lb} \times 4 \text{ in.}}{2 \text{ sq in.} \times 30 \times 10^6} = 0.0015''$$

In other words, our bolts will have stretched one and one-half thousandths when the internal pressure reaches 250 psi. In turn, the two flanges would have become separated by an additional one and one-half thousandths and the gasket would have increased in thickness by the same amount over its thickness under initial tightened conditions. I should add that since strain and stress are proportional, the elongation of the bolts would have been three thousandths, had the internal pressure been 500 psi instead of 250 psi.

I repeat that this design would not have been an improper or unsatisfactory design for such a flange. As a matter of fact, the final stress on the bolts of 26,250 psi is quite reasonable in comparison to the yield strength of the steel used for such bolting.

This analysis, of course, was highly simplified. A centrifugal pump casing flange is far more complex a structure. In addition, part of the casing is subjected to discharge pressure and another part to suction pressure. If we are dealing with a multistage pump casing (see Fig. 2) our problem is even more complex, since the internal pressure varies from suction pressure to full discharge pressure, but differs for each individual stage.

As a matter of fact, bolting and flange stretch or elongation for such a pump is generally determined experimentally, as it is impossible to conduct a strictly analytical study of the "quality" of a casing flange joint under a combination of varying internal pressure at the individual stages.

Fig. 3 shows a gage used in determining the stretch of the two flanges of an axially split casing pump. One or more such gages are clamped to the interstage wearing ring bores on the lower half of the casing. They are so arranged that the spring pushes the soft copper wedges into the split at the adjacent portion of the casing. The plunger is retracted before installation and secured with the holding screw. To determine the gasket compression induced by the initial tightening of the bolts, small pieces of gasket are removed at various places next to the internal edge of the casing flanges. The measurement is obtained by using feeler gages.

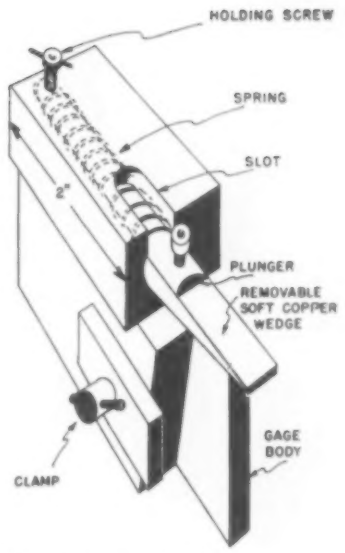



Fig. 3. Flange deflection gage used in experimental analysis of axially-split casing design

After the gages have been installed, the upper half of the casing is put in place and the casing bolts are tightened. As the shaft and impellers are not in place for this test, it is possible to reach into the stuffing box openings and release the gage holding screws. The soft copper wedges are thereby pressed against the closed split by the spring pressure, and they are ready to enter further as soon as the two casing halves stretch apart under the action of the internal pressure during the hydrostatic pressure test.

It is also possible, at this time, to reach in with a feeler gage and measure the thickness of the gasket under initial tightening. Comparison of this thickness with the original gasket dimensions indicates the amount by which initial tightening has compressed the gasket material.

End plates are now secured on the stuffing box openings and the casing subjected to the desired hydrostatic test pressure. The copper

wedges penetrate into the split to the extent that it is opened up under the action of the internal pressure. After the casing has been held under test pressure for the required length of time, the pressure is released.

This causes the two casing halves to return to their original position prior to their deflection under test and an indentation is made by the edges of the casing flanges on the soft copper wedges. When the casing is opened and the gages removed, this indentation permits an exact determination of the casing deflection.

The comparison of this measurement with the restoration curve of the gasket material under varying stresses will indicate whether the size, number and location of the bolts and the gasket material will assure a pump casing that will remain tight under the working pressure conditions.

Note that this test is somewhat more rigorous than the conditions that will prevail in normal operation. This is because the hydrostatic test pressure exceeds operating pressure by anywhere from 25 to 50% and because this pressure is applied throughout the interior of the casing while operating pressures increase stage by stage.

I must repeat: this is standard and normal practice and the bolts holding together the flanges of a pump casing are always stressed and stretched beyond their initial tightening stress and stretch, once internal pressure is applied. This is not improper design — we must resign ourselves to the fact that things built by man must obey the immutable laws that have been imposed by an Agency other than man himself.

*EDITOR'S NOTE: This discussion is very interesting and it gave the editor a rough thirty minutes. Here's how it looks in simple terms. If the reader will substitute coil springs for both the bolt and the gasket — one in tension and the other in compression, he will see that any additional internal pressure must cause movement. Therefore the gasket will "breathe." On the other hand, if you remove the gasket and substitute a ground joint, there would be no movement at the joint until the load on the bolt is excluded. And without movement there could be no additional bolt stretch. Anyone else want to enter the discussion? If so, comments are welcome.*

# Stencils Speed Shipping For Aladdin at Nashville

**TO FACILITATE** the movement of a tremendous variety of merchandise through its warehouse, Aladdin Industries, Inc., at Nashville, Tenn. uses one of the most efficient materials handling systems existing anywhere.

To say that Aladdin's order handling and shipping are streamlined is stating it mildly. From 3,500 to 5,000 cartons a day are processed through the plant using only two men to pick orders, address cartons and load them onto carriers—truck or rail.

When a customer's order reaches the IBM equipment for shipping detail preparation, the same punched card which prepares the invoice and bill of lading also automatically types a stencil which is used for carton addressing. This stencil is the Weber Continu-matic (continuous form) shipment addressing stencil.

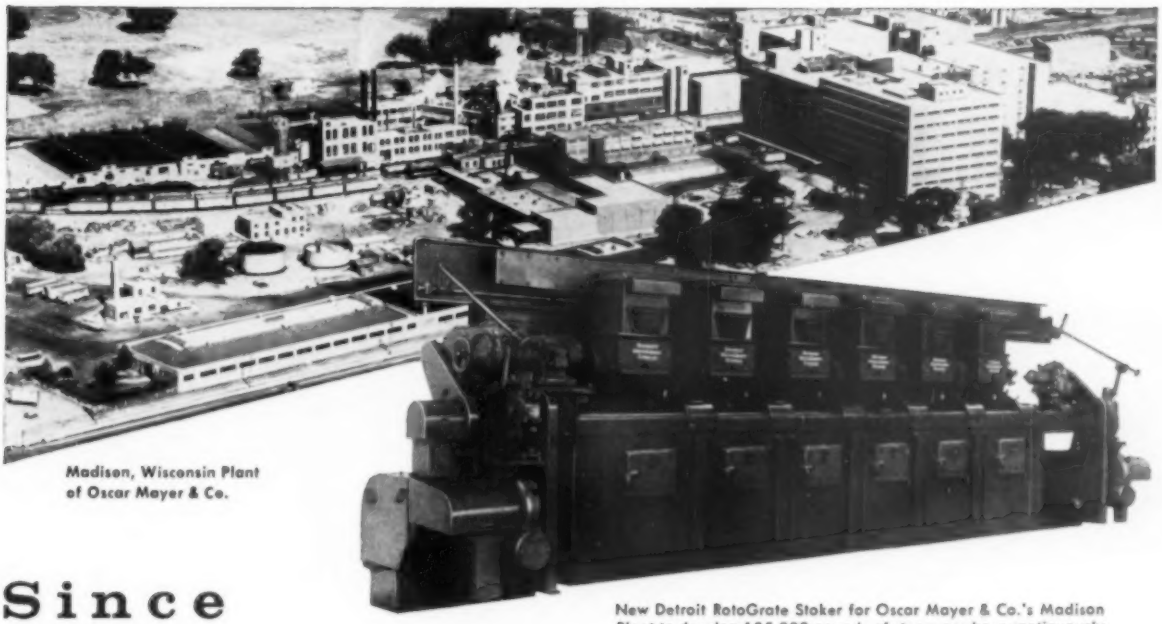
Now — picture a half-circle shaped conveyor with an *order checker* stationed at one end and an *order picker* on the other end. The conveyor travels from the *picker* towards the *checker*.

With this picture in mind, let's go back to the IBM equipment where the Weber Continu-matic addressing stencil was prepared. This stencil now has the name and address plus other shipping details of the customer typed thereon by the IBM. Because these stencils are in continuous form, each customer's shipping details are typed as new invoices and bills of lading are typed — automatically.

After IBM prepares the Continumatic stencil, it is then separated from the continuous form by means of a perforated edge. This stencil is then correlated with the invoice and sent to Traffic for rechecking and then to Shipping for sorting by carrier.

When the invoice, with shipment addressing stencil attached, is received in the warehouse by the Checker, he calls the order to the Picker using a public address system. The Picker selects the stock and places it upon a conveyor that swings in a half-circle as it approaches the order Checker. As the order is being picked, the Checker places the Weber Continumatic stencil upon a Weber handprinter and prepares to address the cartons as they approach his station (see photograph).

After the cartons are addressed they are sent by conveyor into trucks or railroad cars waiting at the loading docks. A telescoping conveyor, which lengthens and shortens easily, enables the company to load at the rate of 500 to 600 cartons per hour.



Madison, Wisconsin Plant
of Oscar Mayer & Co.

New Detroit RotoGrate Stoker for Oscar Mayer & Co.'s Madison Plant to develop 125,000 pounds of steam per hour continuously for 24 hours—150,000 pounds for peaks, when burning Indiana coal, 10530 BTU per pound, 13.25% ash, A. F. T. 1900° F. Helmick and Lutz, Minneapolis, Consulting Engineers.

# Since 1938

## Detroit Stokers have served Famous Sausage Makers with Economy . . . High Availability . . . Low Maintenance

Oscar Mayer & Co., pioneer meat processing firm, has been making sausages since 1883. By stressing quality and uniformity of product, it has grown from a small meat market on the near-north side of Chicago to the nation's 9th largest producer with sales last year of $260,000,000.

In 1938, the company installed a Detroit RotoStoker in the Madison, Wisconsin, plant. Purchase of a plant in Davenport, Iowa, brought them another RotoStoker in 1941.

These served so well that in 1947, they bought a Detroit RotoGrate Stoker for the Madison plant as a part of an expansion program.

When more expansion was planned in 1959, they bought two more RotoGrates, one each for the Madison and Davenport plants, making a total of five acquired since 1938.

Detroit RotoGrate is an overthrow spreader stoker with traveling grates that move slowly forward, discharging ash at the front. Suitable for boilers up to 400,000 pounds of steam per hour capacity . . . it burns any bituminous coal or lignite and many types of refuse, separately or in combination with coal. It is one of the complete line of Detroit Stokers for small, medium and large boilers.

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Cost equals initial investment plus upkeep, plus production losses due to equipment outage. *The total is less with Detroit.*

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For more information, use Reply Card—Page 81

# MANAGEMENT CLINIC


Conducted by ROBERT H. EMERICK, North Charleston, S. C.

## Can Arbitration Help Solve Problems?

### Question . . . . . .

We are trying to evaluate the various aspects of an arbitration clause in our agreement with the Union. If possible, we would like to have answers to the following questions concerning this subject:

1- Does experience indicate that an arbitrator can be counted on to reach a really impartial decision?

2- What can an arbitrator accomplish that company personnel and union officials, working together, can't accomplish?

3- How long does an arbitration proceeding last?

4- How much does it cost?

### What The Records Show . . . . . .

The answer to Question 1, is yes. To be included in one of the arbitration panels maintained by the American Arbitration Association, the Federal Mediation and Conciliation Service, or a similar state body, an individual arbitrator must be supported by expressions of confidence in his integrity and ability, issued over the signatures of officials in industry, and officials of one or more unions. In addition, his background and experience in the field of labor relations is subjected to critical appraisal prior to approval, and he is required to disqualify himself for any dispute in which he conceivably might have a personal interest.

As for Question 2, here are several of many ways in which an arbitrator achieves, after company-union personnel fail. First, the arbitrator's fresh view of a dispute frequently finds an aspect completely overlooked by the parties involved, and which substantially clarifies the issue. Second, wrangling is terminated by the arbitrator; once issued, his decision is final. Third, supercharged emotions, sometimes present in company-union discussions, are not a factor with the Arbitrator. Fourth, his interpretation of the Agreement wording is unbiased.

Before an arbitration hearing takes place, the parties must line up their witnesses and prepare their various documents and other items of evidence. This may require from several days to several weeks.

The hearing itself usually ranges from a minimum of two or three hours, to one or more days, depending on the complexity of the case, the number of witnesses, and the amount of evidence to be considered.

After the hearing, the arbitrator takes the case under study, followed by the preparation of his award — actions lasting on the average from 1½ days to 3 or 4 days. In general practice, an award is delivered to the parties within 30 days after the close of the hearing.

The cost of an arbitration proceeding is affected by the time involved. Records indicate that the direct out-of-pocket expense for the services of the arbitrator, including his fees and maintenance charges for travel, hotel and meals, will range on the average between $275 and $350, usually divided equally between the parties who requested the arbitration. Complex, long drawn out cases, naturally will cost more.

Each party bears its own expenses for witnesses and the preparation of its case.

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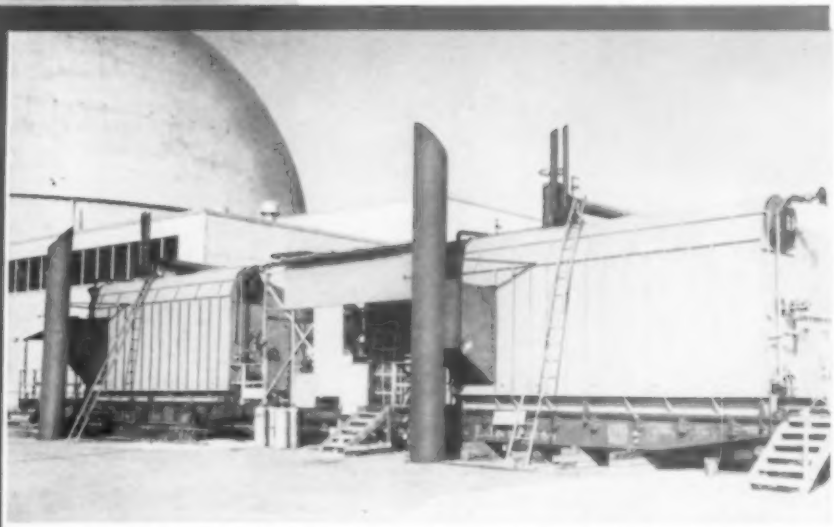

**DRESDEN NUCLEAR POWER STATION**
50 Miles Southwest of Chicago

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COMMONWEALTH EDISON CO.

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THE FIRST FULL SCALE privately financed ATOMIC POWER PLANT to go into operation in the United States.

Its power reactor is larger than any now operating or under construction in the country.

How do you check the nuclear unit steam lines and balance the turbine of an atomic power plant *without waiting* for the start-up of the entire Nuclear Reactor System?

This problem was solved quickly and economically at Dresden with *two Keeler Type DK Package Steam Generators.*

Two 55,000 lb/hr capacity Keeler DK's were fired-up five days after their arrival at the job site—*without removing them from railroad flat cars.* Fuel oil was piped direct to the burners through temporary underground lines from nearby tank cars. All conditions were otherwise arranged to simulate the eventual pattern of operation.

The two DK's were operated at capacities up to 68,000 lb/hr for considerable periods in the preliminary checking and later final testing of the plant's steam system, and balancing of the turbine.

Field reports indicated actual operating efficiency of the two Keeler units was *well above the 81.3% original guarantee*—in an application which ideally demonstrates the reason these DK units are described as *"multi-purpose steam generators"!*

Keeler is one of the nation's leading manufacturers of steam generators, with a complete line ranging from low cost package units up to 100,000 lb/hr and field erected units up to 200,000 lb/hr—for all fuels, all types of firing.

Nearly a century of versatility, economy and dependability are yours when you specify and insist upon Keeler Quality. *Write for full data . . .* there's a Keeler unit to efficiently serve your steam requirements.

*The Seal of Quality in Water Tube Steam Generators*

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**No. DK-2: Type DK Package Boilers**
**No. F-14: Type CP Boilers**
**No. M-2A: Type CPM Package Boilers**
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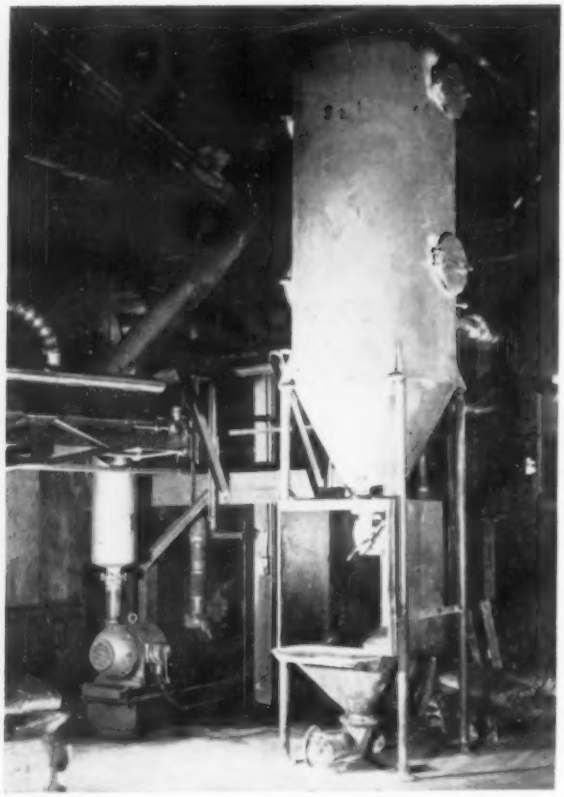
# Pneumatic System Improves Operation for Delaware Plant



**THE AMERICAN** Brake Shoe Co., New Castle, Delaware, needed to obtain more rapid flow of bentonite, dextrin, silica flour and other materials from receiving point to tanks for subsequent mixing. Originally, sacks of material were delivered to the plant and placed on pallets for transfer to tanks by fork lift trucks.

The installation of a U. S. Hoffman pneumatic conveying system solved the problem. Materials are introduced into an air stream through a non-clogging intake valve attached to the bottom of a hopper. They then flow smoothly through pipe lines to any one of six primary cyclone storage tanks more than 350 feet distant.

The material intake valve insures the uninterrupted flow of material through the conveying system. Suitable for use with 2" through 6" pipelines, it is equipped with standard 8" flanges and can be easily attached to the bin, hopper or dust collector.

Connected equipment is protected from exposure to the full suction of the system by a separate air inlet. The material handling rate can be adjusted while air is flowing. Thorough mixing insures smooth transit.

The pneumatic conveying system not only simplified bulk conveying chores but paid its way in a few months by providing substantial production material, and labor savings.

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# Advances in Gas Technology

By ELTON STERRETT

**SPONSORED** jointly by the Southern Gas Association and Texas College of Arts & Industries, the 15th annual Short Course in Gas Technology, held in Kingsville, Texas in June, considered various phases of the production and utilization of natural gas; a resource which, either as fuel or as raw material, is assuming ever larger importance in the industrial life of the South.

Subjects covered by the 19 papers included in the six sessions of the course ranged from a survey of the applications for today's high speed gas turbines to non-destructive methods of pipe testing, each presented by an authority on his subject.

**Clarence Taylor,** engineer with Gulf Interstate Company, Houston, summarized the advancement of the combustion turbine as exemplified by the 1000-hp 20,000-rpm units now being experimentally proved in pipeline compressor station operation at speeds which enable the power to be delivered by a unit unbelievably small in comparison with earlier turbines.

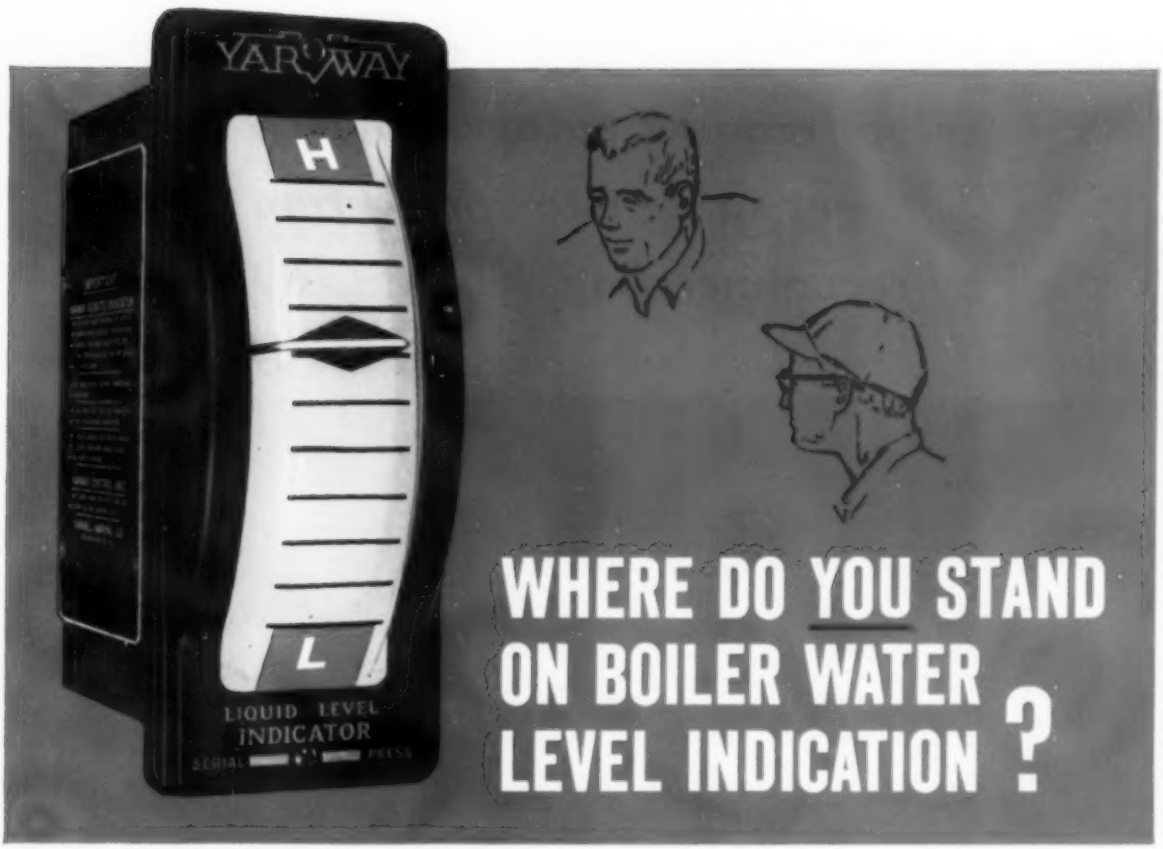
In multi-unit installations operating economy is attained by maintaining a complete stand-by unit for replacement whenever any of the turbines in such a system require maintenance.

Design of these high-speed — "ultra-high-speed turbines" as they are frequently designated — is such that it is possible to remove bearing and seal assembly from either end without disconnecting intake air or exhaust connections. So advanced is the design of these units that a total of 150 man-hours has proven adequate for major overhaul.

Simultaneously with the development of these 1000-hp units has come the commercial production of small, self-contained turbines with ratings as low as 15 hp, which offer industry a light, compact power unit adaptable equally to fixed installation in a plant or placement under the hood of a mobile unit.

**Walter Gunkel,** Southwest Research Institute, San Antonio, summarized progress in the non-destructive testing of pipe by the use of supersonic sound waves. Over the past two years the Institute has been developing cells with a frequency of 30,000 per second, and experimentally determining the placement of multiple units so as to scan a section of pipe at a rate ultimately expected to reach 100 feet per minute.

By varying the angles at which the individual supersonic beams strike the pipe, penetrate the met-




**Yarway Remote Indicators have "wide angle" visibility from multiple vantage points**

Yarway Remote Liquid Level Indicators bring distant, often hard-to-see boiler level readings right down to eye level on the panel board or other convenient location.

No matter where you stand—at any point in a 180° arc, and from a considerable distance—the brilliant new wide vision dial makes viewing and reading easy.

**Accurate readings because Indicator is operated by boiler water itself**

Remote readings of levels in boilers (also feed water heaters and other heat exchangers) are instant and accurate because indicator *operating mechanism* is actuated by the varying head of the liquid itself, yet the *pointer mechanism* is never under pressure.

**Fully approved under Boiler Code Case #1155**

Under A.S.M.E. Boiler Code Committee ruling in Case #1155, two independent remote level indicators of compensated manometric type may be used as primary indicating elements instead of one of the two gage glasses required for boiler pressures 900 psi and above. When both indicators are in operation, one gage glass may be shut off but shall be maintained in serviceable condition.

Yarway Remote Liquid Level Indicators conform to this ruling and are used widely for primary boiler water level indication in plants operating at 900 psi and above.

All Yarway Indicators for service over 700 psi are temperature-compensated; pressure compensation available when desired. Use of controlled-temperature column on constant head chamber fully protects against system upsets.

*If you would like a reprint of this Boiler Code ruling, just ask for Case #1155 reprint.*

*Get the full story on Yarway Liquid Level Indication for your plant. Write for new 24-page Bulletin WG-1825.*

**YARNALL-WARING COMPANY**

*Home Office:* 116 Mermaid Ave., Phila. 18, Pa.

*Southern Office:* Bona Allen Bldg., Atlanta 3, Ga.

YARWAY

*A MARK OF QUALITY IN STEAM ENGINEERING*

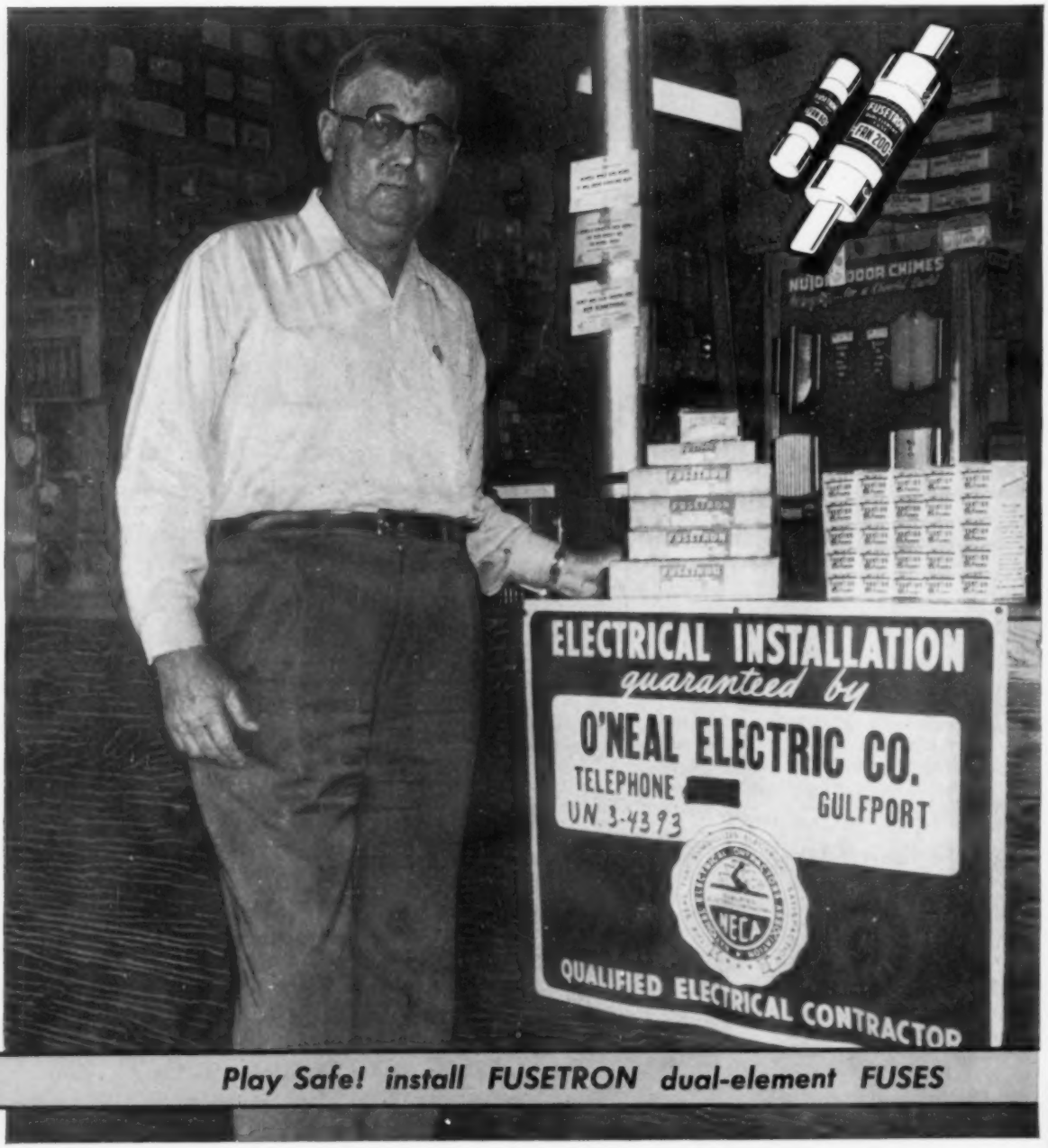
**TYPICAL USERS OF YARWAY INDICATORS FROM OVER 15,000 INSTALLATIONS**

**INDUSTRIAL PLANTS**
WEYERHAEUSER COMPANY
GENERAL ELECTRIC COMPANY
STAUFFER CHEMICAL COMPANY
U. S. STEEL COMPANY
GENERAL MOTORS
MOBIL OIL COMPANY

**UTILITIES** (Code Case #1155 Installations)
COMMONWEALTH EDISON
ILLINOIS POWER CO.
WISCONSIN POWER & LIGHT
PUBLIC SERVICE OF INDIANA
IOWA ELECTRIC LIGHT & POWER
NEBRASKA POWER
NEW ENGLAND POWER
ROCHESTER GAS & ELECTRIC CO.
PENNSYLVANIA ELECTRIC CO. (ERIE, PA.)
LOUISIANA POWER & LIGHT
POTOMAC ELECTRIC POWER CO.

*"We helped a customer stop frequent outages and get safe motor protection . . . by recommending FUSETRON Fuses"*

OSCAR O'NEAL SR., PRES.
O'NEAL ELECTRIC CO., GULFPORT, MISS.




**Play Safe! install FUSETRON dual-element FUSES**

*Mr. O'Neal continues . . .*

"Sometime ago, the Gulfport Ice Co., called us in to do their electrical maintenance work. At the time, they were having a great deal of difficulty with motor starting currents causing ordinary fuses to blow. They were using 100, 200 and 400 amp. ordinary fuses to protect the motors.

"These frequent outages disrupted the company's normal operation and created a costly and annoying situation. Just to replace the 400 amp., 250 volt ordinary fuses was costing them about $40 a month.

"My first recommendation to them was to change to Fusetron dual-element fuses in the proper size for safe motor protection. They did.

"The installation of Fusetron fuses was the 'key' to the problem. In the past five years I do not recall one 400 amp. Fusetron fuse having blown — and outages on the 100 and 200 amp. circuits have been very infrequent."

**YOU TOO, CAN GUARD AGAINST UNNECESSARY OUTAGES OR MOTOR BURNOUTS THAT CAUSE MEN AND MACHINERY TO STAND IDLE SIMPLY BY INSTALLING FUSETRON DUAL-ELEMENT FUSES THROUGHOUT THE ENTIRE ELECTRICAL SYSTEM.**

*In addition to saving you money by protecting against needless outages and motor burnouts*

## FUSETRON Fuses offer High Interrupting Capacity and Life-Time Dependability Essential to Modern Protection.

**High Interrupting Capacity:** With electrical network capacities steadily increasing, — a *modern* protective device must be capable of interrupting the heavy fault currents now available and to be adequately safe to allow for anticipated growth in service demands.

FUSETRON fuses give you this protection. They have an exceptionally high interrupting rating of 100,000 amperes rms symmetrical.

**Life-Time Dependability:** The increase in available fault currents has emphasized the need for dependability in modern protective devices, otherwise, serious fire and personal injury can result should the device fail to operate when an emergency arises.

FUSETRON fuses provide safe and accurate protection through the years as their operation depends on a simple thermal law. Unlike mechanically operated devices, Fusetron fuses have no hinges, pivots, latches or contacts to stick or get out of order.

Once properly installed, Fusetron fuses require no maintenance, — no periodic inspection and accompanying down-time.

If you are considering a new installation or the modernization of an electrical system — you can be sure of modern, safe, maintenance-free protection in 10 or 20 years by installing Fusetron dual-element fuses now.

*For more information on FUSETRON dual-element fuses . . . Write for bulletin FIS.*

**BUSSMANN MFG. DIVISION**
McGraw-Edison Co.
St. Louis 7, Mo.

360

***throughout entire Electrical System!***

FUSETRON BUSS — TRUSTWORTHY NAMES IN ELECTRICAL PROTECTION — McGRAW EDISON

al, and are reflected from the inner surface of the pipe wall and/or a defect in the pipe material, and registering these anomalies electronically, it is possible to define the extent and accurately locate the abnormality in the metal.

Progress is being made in the development of a unit which will automatically assess the seriousness of a fault, and thus eliminate the human element in evaluating pipe defects. The speaker pointed out that the range of defects of all types is on the order of 0.001% of all pipe produced, not all of which condemn the pipe for use. Effective determination of the influence of this percentage, when coupled with positive weighing of the hazards in such a defect, would greatly speed up the placing of power or process piping and eliminate the occasional service failures now encountered. At present, such supersonic pipe testing is confined to laboratory or shop conditions.

**Leo B. Croley,** Phillips Petroleum Company, Bartlesville, Oklahoma, discussed a new high-density polyethylene pipe made by commercial pipe fabricators from one of his company's polyethylene formulations which possesses higher tensile strength and greater rigidity than normal pipe.

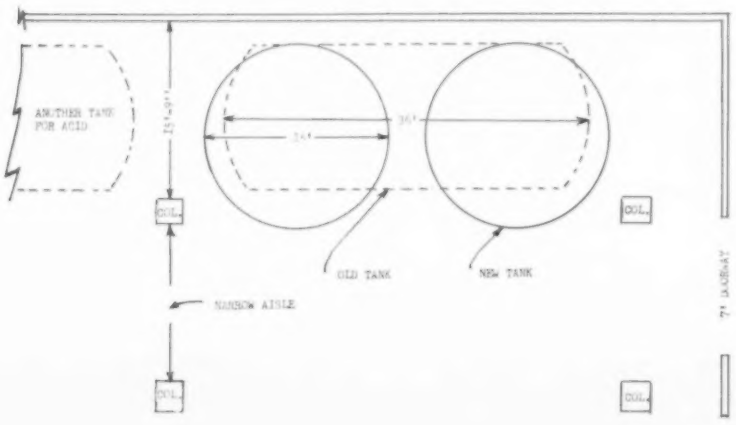
This pipe increases rapidly in hoop strength with lowered working temperatures and is employed in services ranging up to 200 psi where elevated temperatures are not encountered. He described a jointer — skid-mounted on a rubber-tired chassis — which utilizes a self-contained electric generator, alignment clamps for a pair of pipe ends, and a heating plate against which the adjacent ends of two pipe lengths are held until a temperature of 380 to 400 F is reached. The plate is quickly removed, and the softened pipe ends pressed together. The resultant joint is cooled in 30 seconds, and is stronger than the run of pipe.

The plastic material may be formed to relatively close arcs when preheated, and may be equipped with cast sweep fittings for close quarters. Being practically inert to hydrocarbons and most commercial chemicals, this pipe is finding wide application in pharmaceutical and food-processing plants, water and gas systems, and as conduit for high-tension electrical circuits.

The course concluded with conducted tours to natural gas installations in the area.

# Storage Tank Problem Solved

**A TEXTILE** finishing plant discovered an expensive leak in a 16,000-gallon caustic storage tank. An investigation revealed that the 36' x 9' tank had been installed in 1932 and after many years of service was deteriorated to a point beyond repair.




Structural changes in the building and installation of other equipment since the tank had been installed eliminated the possibility of substituting an identical tank because of space limitation and access to the area (both headroom and lateral space). Many pipes had been installed and other equipment and structural members of the building interfered. It was found that the tank had been lowered into place originally, and later a concrete floor had been poured over the area.

### Two Vertical Tanks

In attempting to solve the problem of replacement, a number of smaller tanks were considered but were found much more expensive. In this instance the most satisfactory solution to the problem was found to be two cylindrical tanks arranged to stand on end, each measuring 14½' x 7½', and made in halves to be put into place before welding the halves together. This arrangement permitted using maximum clearances in both directions as well as getting the parts through the access area to the tank location.

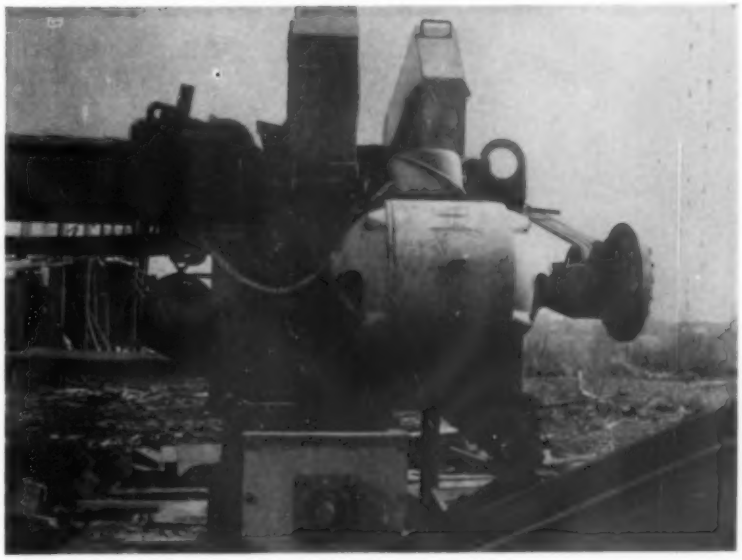
No problem existed in pouring concrete footings to support the new tanks because the two tanks rest on flat concrete slabs and require no contoured cradle like the tank being replaced.

The replacement tanks also permitted a 10% increase in storage capacity. Actually, a 20% increase in capacity was possible but purchase quantities and local conditions made the 10% increase in capacity an optimum figure.

An additional advantage of two tanks in place of the single tank previously used is more flexibility in that the caustic is an 80% concentrate as received and is diluted as it is brought in sometime.. Separate tanks allow alteration of concentration in one or the other of the tanks to bring the liquid to desired specifications.

Also, a tank failure no longer entails risk of the entire supply of caustic. The two new tanks were made of mild steel to specifications by a tank manufacturer and were delivered in halves to be welded together after being put into position.

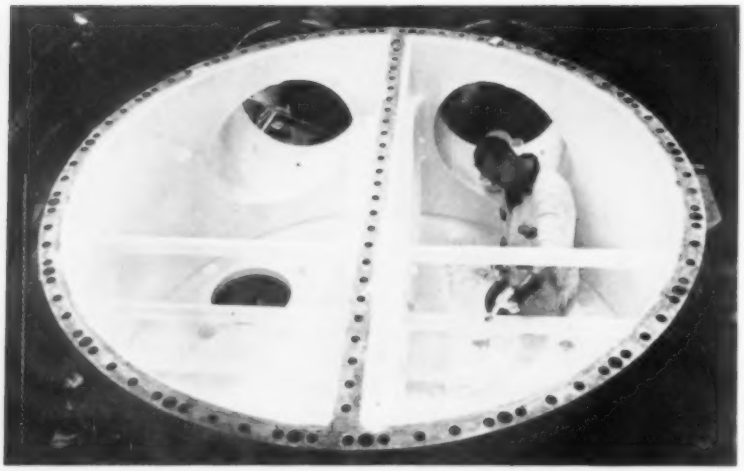
## Motor Failures Checked



**FREQUENT** motor burnouts were a source of trouble and expense to the management of McIntyre Veneer Company, Denham Spring, Louisiana, before a Dodge Flexidyne Dry Fluid Drive was installed on its wood chipper to improve performance.

The chipper is driven by a 50 hp, 1750 rpm motor and is started twice a day. Without controlled acceleration starting, the heavy load required from 35 to 40 seconds to reach full running speed, and at the end of 25 seconds the motor was still pulling 375 amperes. This had caused the motor to fail three times within six months.

The company decided to try reducing starting current draw by installing the new dry fluid drive, which also provides protection against starting shock and overload. No motor failures have occurred in more than a year. The motor pulls only 150 amps during acceleration, and the load is up to speed in only 15 seconds. The 15D Flexidyne also starts the chipper more smoothly and has resulted in an appreciable saving on v-belt wear.



## Water Box Gets Epoxy-Resin Coating

**THERE** is growing evidence that plastic coatings will contribute to longer condenser water box life.

Here, an experimental 1/16-inch epoxy-resin coating is being brushed on the interior of a fabricated steel water box for an 18,000-sq ft surface condenser for the new 450,000-kilowatt Unit 5 at the Philip Sporn Plant on the Ohio River in West Virginia. The welded tube condenser will serve a boiler feed pump turbine at the plant.

Other water boxes for Allis-Chalmers condensers are being similarly treated for protection against corrosion.

## Computer Control for Houston Plant

**AN ELECTRONIC** computer soon will take over the heretofore manual job of controlling manufacturing at the world's largest synthetic rubber plant at Houston, Texas.

The computer, with the aid of electronic measuring devices, will immediately spot and correct changes in the processing factors as the material flows through a complicated system of pipes and reactors — the high pressure vessels in which man-made rubber is formed.

Sam DuPree, vice-president in charge of production for The Goodyear Tire & Rubber Company, said the computer will eliminate the time lag between the instrumented recording of process changes and action by an operator to make the necessary corrective adjustments.

This precise and almost instaneous control system is being custom engineered and built by Goodyear Aircraft Corporation, Akron, Ohio, to provide better and more uniform product quality as well as greater production, Mr. DuPree said. This is possible, he explained, because computer controls increase reactor efficiency and minimize the production of off-specification rubber.

Since output is related to plant refrigeration capacity, the computer also will calculate the total refrigerant load available for use. This, too, will help to increase production as the computer will automatically establish maximum production rates within the refrigerant capacity.

Initially, the computer system will be installed on one chain of reactors. During the production process, special instrumentation will feed continuous information to the computer.

The computer, having been preset to conform to the formula of the rubber being made, will correct any undesirable changes in temperature, pressure or rate of flow that might affect quality or output.

On its past record, Goodyear's Houston plant has been rated by the industry as a top performer in efficiency, quality and productivity. With electronic computers rather than human judgment for plant control, Mr. DuPree predicts even better performance.

## Battery Charger

**THE UTILITY** rectifier charger was the subject of a paper, "A Constant Voltage Battery Charger," by C. H. Leet, the Electric Storage Battery Co., and W. Zug, the Electric Products Co., presented at a symposium on the Chemical Industry during the Summer General Meeting of the American Institute of Electrical Engineers.

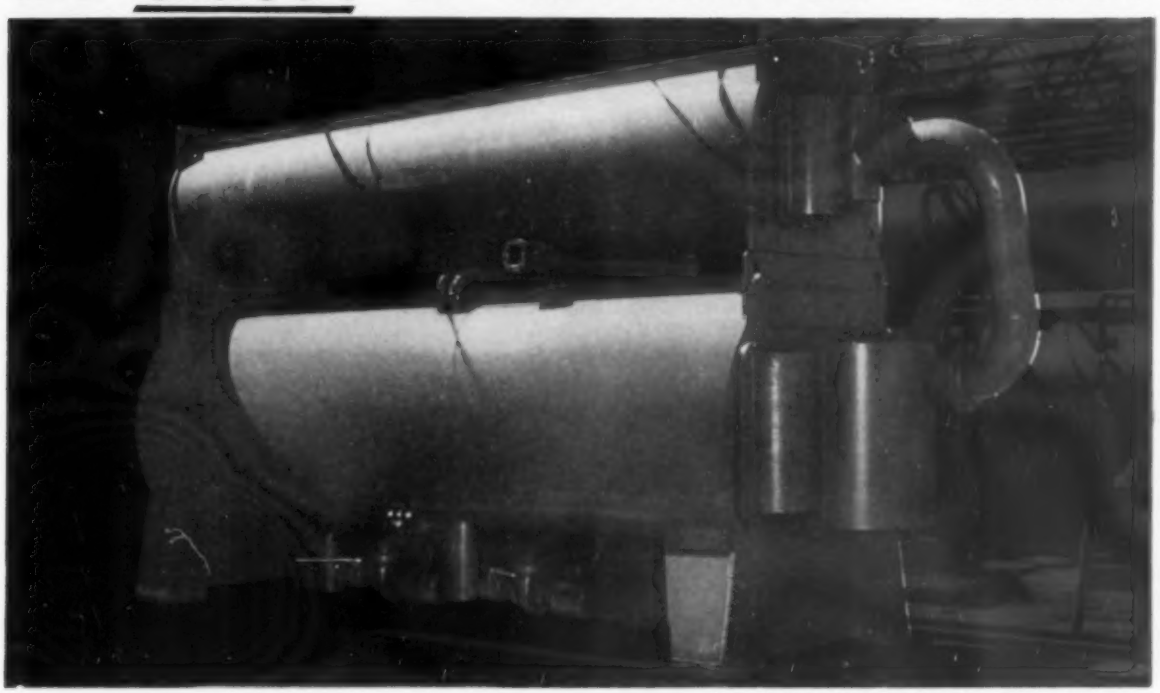
The "UR" charger was developed to overcome the deficiencies of both the rotating charger and the rectifier charger.

The charger, for use in control centers, such as electric power substations and central stations, uses the latest advance circuit technique in connection with components such as silicon rectifiers that have no detectable aging and theoretically unlimited life and magnetic amplifiers that have long life comparable to a transformer and high efficiency.

The authors said that the charger retains or improves all the advantages of the rotating charger and is relatively insensitive to alternating current voltage fluctuations. It will regulate the output current to a safe value for charger and battery and can easily be adjusted for output voltage. It retains the ruggedness of a machine and actually improves overall conversion efficiency. The "UR" charger eliminates all the obvious disadvantages of a rotating element, such as wear, maintenance and noise.

Previous static chargers, they said, were sensitive to alternating current voltage fluctuations, which has been an important factor in preventing the static rectifier from being widely used.

# Even boiler-cooled air conditioner faces the *Oldest* of maintenance troubles



Photographed at Delta Air Lines New Jet Base Hangar, Atlanta Airport

## Lithium bromide absorption systems need protection of their condenser cooling circuits

A popular development in air conditioners is the boiler-fed, water-cooled lithium bromide absorption system. It is economical and efficient, but since water plays a major part in its operation its maintenance problems are the same old ones—metal rusting, pitting, scaling and reducing efficiency to a point of complete breakdown.

Two ANCO products—Coolex and SR-2—can help you get and maintain top performance from your air conditioning system by neutralizing the effects of scale-forming and corrosive elements. Coolex and SR-2 keep rust and scale from forming and acting as insulators, from reducing heat transfer to an ineffective minimum. With the proper treatment program using these products the capacity of your system is maintained, operating costs are held to a minimum.

There are competent ANCO service representatives throughout the South who are experienced in all phases of water treatment and who will be glad to come by your office and give you the full story. Call or write to one of the offices listed below and we'll see that you get prompt attention. A simple maintenance program now may save you hundreds of dollars later, and there is no obligation on your part for talking with one of our men.

*Write today and request an Anderson service engineer to make an analysis and recommendation on your plant's water treatment. There is no cost for this service.*

SPECIALISTS IN MAKING WATER BEHAVE

**Anderson Chemical Company, INC.**

Macon, Ga., Box 1424 • Phone Sherwood 5-0466

Memphis, Tenn.: Box 2432, DeSoto Station • Phone: BRoadway 2-2806

# City of Miami Beach Specifies PVC Conduit

**HIGHLIGHTING** a new type of conduit, the City of Miami Beach's electrical code now specifies that rigid unplasticized polyvinyl chloride pipe, Schedule 40, should be used for conduits in certain installations of electrical, signal and telephone wiring where corrosion is a problem.

Known for its corrosive resistant qualities, lightweight and easy installation in a variety of industrial applications, this type of PVC pipe has been specified by the City of Miami Beach for conduit when installing electrical wiring in pool decks and pump rooms, underground branch circuits located in open ocean-front public areas, dock wiring and for signal and telephone wires when installed underground or in first-floor slabs.

In applications other than signal and telephone systems, a bonding conductor equal to the largest current-carrying conductor should be installed in the raceway in electrical applications. All metallic fittings and fixtures should be bonded to this conductor, according to the Miami Beach code.

The Florida Power and Light Company used 2-inch, Schedule A, High-Impact National PVC Pipe and Schedule 40 PVC conduit bends to install electrical wiring to oil circuit breakers at the Greynolds Substation, North Miami Beach, Florida.

While National Tube, Division of U. S. Steel, can furnish regular conduit bends, field bending of smaller sizes is easily done with a standard electrician's conduit bender. The use of a small propane torch for bends greater than 45 degrees is recommended.

Among other features, the excellent chemical resistance of National PVC Pipe makes it especially suitable for applications where corrosion is a problem. It resists attack by acids, alkalies, salt solutions and alcohol, as well as other chemicals. Because it is also resistant to fungi, soil and bacterial action, PVC pipe is recommended for underground installations. It is rigid, so it can also be used for overhead installations with pipe supports.

PVC pipe can be readily joined by a number of methods including solvent cementing, threading and heat welding. Threading is only recommended for Schedule 80 or heavier walls. While the service requirements of the installation determine the best method of joining, solvent cementing is highly recommended since it is the fastest and easiest method and produces the highest joint strength. Its speed and simplicity reduce installation costs.

PVC conduit can be easily cut with a hacksaw, tubing cutter or rotary power saw.

## *Southern News Briefs*

(*Continued from page 18*)

### New Virginia Plant for Diesel Injection

Construction is in progress on a modern $250,000 headquarters plant and office for **Diesel Injection Sales and Service, Inc.**, Norfolk, Va. According to H. E. Wittersheim, president, the new structure is scheduled for completion late this year. It will be fully air-conditioned and will contain 28,000 square feet of floor space, more than 3 times that of the present plant. New equipment to be added will include Clayton 500 hp chassis and engine dynamometers.

Diesel Injection specializes in fuel injection units and allied equipment for the railroad, marine, motor transportation, construction, and the power industries. It is also supplier for Leslie Hartridge test and repair equipment to the entire diesel industry in this country. The firm has branch operations at Richmond and Salem, Virginia, and Charlotte and Raleigh, North Carolina.

### Nuclear Power Plant, S. C.

**The Daniel Construction Company,** of Greenville, South Carolina, will construct the nuclear power plant at Parr, South Carolina, planned by **Carolinas Virginia Nuclear Power Associates, Inc.**

The four-company project is scheduled for completion in 1962. The Parr plant will be the first nuclear plant in the Southeast. Parr is about 30 miles from Columbia, South Carolina. Other member companies of CVNPA are: South Carolina Electric and Gas Company, Duke Power Company, and Carolina Power & Light Company.

### Tampa Electric — Plant City, Fla.

Plans to build a new office building in downtown Plant City, Fla., were announced by Tampa Electric Company. The utility firm has purchased a tract which covers an entire block.

The new building will be similar in architectural design to the main office building in Tampa. It will be approximately 7,000 square feet in size and will house Plant City Division general offices, accounting department, sales department, Leisure House and display area.

Construction, which has been budgeted by the firm at $180,000, will begin later this year.

## PLANT PERSONNEL

**R. J. Martz** is local plant manager at Belle, West Virginia, where a long range expansion program has been initiated by the Chlorinated Products Division of Diamond Alkali Company.

Newly appointed industrial engineers for Wunda Weve Carpets' Greenville, S. C., mills are **Numa Martin** and **Lynn A. Hendricks.** Mr. Martin was formerly with Mohasco Industries at Greenville, Miss. Mr. Hendricks is an engineering graduate of Clemson College.

**Walter E. Selkinghaus,** superintendent of CP&L's new Darlington County steam-electric generating plant near Hartsville, S. C., is leaving his post on Aug. 6 for a year's nuclear training program at Oak Ridge before assuming duties as superintendent of the atomic power plant now under construction at Parr, S. C.

Chemstrand Corporation has appointed **Cole Downing** to the position of manufacturing manager at its Decatur, Ala., acrylic fiber plant. **Chester H. Goodwin** has been named plant engineer, and **John Lomartire** is now superintendent of quality control. Superintendent of production control is **Harry Anschutz.** The newly created position of superintendent, special services, has been filled by **H. H. Custer.**

**Walter C. Beattie,** previously plant manager at F & P Steel Pipe Corporation in Jacksonville, Florida, has been elevated to the position of vice-president in charge of operations.

**L. L. Eley, Jr.,** replaces **L. D. Johnson, III,** as chief design engineer for Virginia Electric & Power Company. Mr. Johnson has been appointed assistant Richmond district manager. **J. V. Barker** has been named assistant superintendent of construction. He is succeeded as system superintendent of distribution by **A. S. Hadfield,** formerly manager at Portsmouth.

**Thurman L. Rundlett** has joined Anderson Electric Corporation at Birmingham as chief engineer. Mr.

(*Continued on page 62*)

## FUTURE EVENTS of Engineering Interest

**Sept. 7-15: 2nd Coliseum Machinery Show,** Chicago Coliseum, Chicago, Ill. A. Byron Perkins, Exec. Mgr., 2807 Sunset Blvd., Los Angeles 26, Calif.

**Sept. 18-21: ASME Petroleum Mechanical Engineering Conference,** Jung Hotel, New Orleans, La. American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y.

**Sept. 21-23: 1960 National Power Conference,** Bellevue Stratford Hotel, Philadelphia, Pa. Power Divisions, AIEE and ASME, 29 W. 39th St., New York 18, N. Y.

**Oct. 17-21: 42nd National Metal Congress & Exposition,** Philadelphia Trade & Convention Center, Philadelphia, Pa. American Society for Metals, Metals Park, Novelty, Ohio.

**Oct. 24-25: ASME-AIME Fuels Conference,** Daniel Boone Hotel, Charleston, W. Va. American Society of Mechanical Engineers, 29 W. 39th St., New York 18, N. Y.

**Nov. 1-3: Material Handling Institute,** Central States Show & Technical Conferences, Kentucky Fair & Exposition Center, Louisville, Ky. Paul A. Fisher, Ch. Engr., Anaconda Aluminum Co., Louisville, Gen. Chm.

**Nov. 28-Dec. 2: 24th National Exposition of Power & Mechanical Engineering:** ASME Annual Meeting, Statler Hilton Hotel, New York. International Exposition Co., 480 Lexington Ave., New York 17. E. K. Stevens, Mgr.

**Feb. 13-16, 1961: 15th International Heating & Air Conditioning Exposition,** International Amphitheatre, Chicago, Ill. American Society of Heating, Refrigerating & Air Conditioning Engineers, National Meeting. International Exposition Co., 480 Lexington Ave., New York 17. E. K. Stevens, Mgr.

**April 12-13, 1961: AIEE Materials Handling Conference,** Hotel Sheraton, Philadelphia, Pa. H. A. Zollinger, Chm. AIEE Materials Handling Subcommittee, Westinghouse Electric Corp., Pittsburgh, Pa.

# Pacific Process Pump **EXTRAS** bring **EXTRA PROFITS** to you!

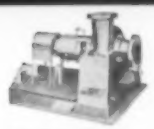
**EXTRA CORROSION ALLOWANCE**—All Pacific Process pumps are custom-built with case casting thickness in excess of actual pressure-temperature requirements. This provides a liberal allowance for corrosion-erosion and a high safety factor.

**EXTRA HEAVY CONSTRUCTION**—Pacific process pumps are engineered to combine the strength necessary for continuous heavy duty service with design simplicity and accessibility for low maintenance cost. All parts in contact with pumped liquid may be fabricated from any commercially available ferrous or non-ferrous metal.

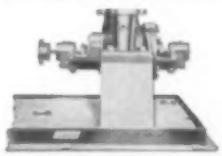
**EXTRA LONG LIFE**—Guided inlet flow reduces friction losses—insures minimum required NPSH. Dynamically, radially, and axially balanced moving parts eliminate vibration that would cause damage to rings, bushings, bearings, packing or mechanical shaft seals and excessive radial and thrust loads on bearings. Result—greatly increased availability for profitable operation.

*Write for bulletins—please specify pump type.*

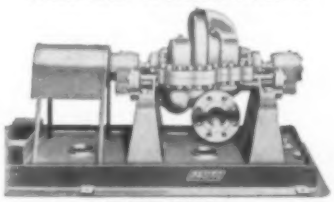
MAXIMUM PARTS INTERCHANGEABILITY
is an extra feature in
PACIFIC PROCESS PUMPS



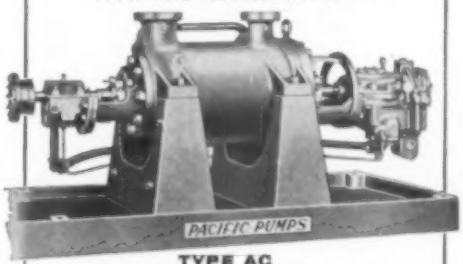
**TYPE SVC**
To 850°F.—25 to 3200 GPM
To 600 PSIG—To 650 DIFF. HD. FT.



**TYPE HVC**
To 850°F.—600 to 4500 GPM
To 600 PSIG—To 1000 DIFF. HD. FT.



**TYPE RHC**
To 500°F.—50 to 3000 GPM
To 700 PSIG—To 1300 DIFF. HD. FT.




**TYPE AC**
To 850°F.—100 to 2500 GPM
To 1000 PSIG—To 2600 DIFF. HD. FT.

**PACIFIC PUMPS INC**
*A Division of Dresser Industries, Inc.*
HUNTINGTON PARK, CALIFORNIA

PACIFIC®

*Offices in All Principal Cities*

CP-19

## *Southern News Briefs*

(*Continued from page 60*)

Rundlett came to Anderson from Staunton, Virginia, where he had been division engineering manager of Westinghouse Electric Corporation's Air Conditioning Division.

Staff engineer, Pulp and Paper Mills, for the Rust Engineering Company at Birmingham is **Richard S. Bean,** who was formerly plant engineer with Hollingsworth and Whitney at Mobile.

Plant supervisor of Pennsalt Chemicals Corporation's new facility at College Park, Georgia, is **Larry J. Browder.**

### VEPCO Starts Dam

Actual construction of **Virginia Electric and Power Company's** $50,000,000 Gaston hydroelectric dam, eight miles upstream from Roanoke Rapids, N. C., has been set for Aug. 1.

The contract to build the dam has been awarded to the Stone and Webster Engineering Corporation, the same firm that built the Roanoke Rapids project. Completion date has been set for the spring of 1963. Preliminary work, including the acquisition of reservoir property, has been proceeding for several months. The new 200,000 kilowatt station will have four 50,000 kilowatt units.

### Columbia-National Reopens Florida Plant

**Columbia-National Corporation** has resumed production of zirconium sponge at its Santa Rosa plant near Pensacola, Florida.

Columbia-National, a subsidiary of the Columbia-Southern Chemical Corporation, closed the Santa Rosa operation last December, the government having previously quetsioned the quality of the zirconium metal sponge produced at that location. Company personnel have been working with the Atomic Energy Commission and with representatives of the U. S. Navy on the problem, which was satisfactorily resolved early in May. Technical employees who were temporarily assigned to plants of the parent company have been recalled to the Santa Rosa operation.

Zirconium sponge produced at the Florida facility is required in the manufacture of Zircaloy, a metal

(*Continued on page 65*)

# Facts you should have on file under "stokers"... and "savings"

**(File this page, send coupon now)**

Whether your company will talk new stoker next month or three years from now, your review of stoker performance will not be complete without the facts on AE Vibra-Grate Stokers and the outstanding savings assured with the exclusive Vibra-Grate design.

The AE Vibra-Grate Stoker is the only stoker which combines the maintenance-savings features of water cooling and the high-efficiency features of a vibrating grate and controlled zone undergrate air.

Operating reports from some of the country's most cost-conscious companies now using Vibra-Grate Stokers are nothing short of phenomenal.

**For example:** A 40,000 lb boiler fired by a Vibra-Grate Stoker at S. C. Johnson & Son (makers of Johnson Wax Products) has never had an unscheduled shutdown since the stoker was installed in October 1954. Coal savings have averaged 919 tons per year. There has been no trouble with clinkers or coking coals. Total repair costs for the first five years, when 34,962 tons of coal were consumed, were only $188. A hair over ½ cent per ton of coal!

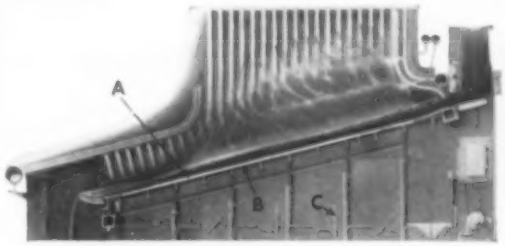
**For example:** At Spaulding Fibre Company, two Vibra-Grate Stokers have saved 2000 tons of coal in two years, compared with other stokers in the same plant. Average evaporation on one unit is 10.6 lb of steam, 10.8 on the other, using coals having an average Btu value of 13,173. The company writes, ". . . efficiency and operating economies far in excess of the manufacturer's guarantee and our highest expectations".

**For example:** Savings of $300 a day are reported by a major textile manufacturer. In this instance oil fired boilers were replaced by a 70,000 lb/hr Vibra-Grate Stoker. The unit is operating at 80.7% efficiency, even though the boiler has no heat recovery equipment.

**For example:** An old 40,000 lb/hr boiler was restokered with a Vibra-Grate for Edgewood Division, Pilgrim State Hospital, Brentwood, Long Island. Savings are averaging 8 tons of coal per day.

### Highest efficiencies anywhere

Because the AE Vibra-Grate Stoker design is completely different you get a range and combination of advantages not possible with any other stoker.




The vibrating grate (A) insures compact distribution of fuel, and elimination of holes and light spots. Thus, the stoker can handle low or high volatile bituminous coal, as well as lignite and semi-anthracites—wet or dry.

Water-cooled grate (B) permits use of gas or oil fuels, singly or in combination with coal. Clinkering and coking are minimized, grate maintenance is virtually nil.

Individual control of combustion air in separate wind box zones (C), plus over-fire air system, eliminates smoke at both high and low steaming rates. There is no need for a dust collector. Ashes can be removed by conventional systems.

The complete Vibra-Grate story is covered in our new catalog S-546-A. Send for your free copy now, so all the Vibra-Grate facts will be available when you need them.

**AMERICAN ENGINEERING COMPANY** Division of United Industrial Corporation
**Wheatsheaf Lane & Sepviva St., Philadelphia 37, Pa.**

**ALL NEW**

Complete Vibra-Grate story in 16-page catalog. Includes specifications, operating and efficiency data. Mail coupon for your free copy now.


**American Engineering Company** Division of United Industrial Corporation
Wheatsheaf Lane & Sepviva St., Philadelphia 37, Pa. Dept. S-103

☐ Please send new catalog on Vibra-Grate Stokers

☐ We would like to discuss our stoker needs. Please have a representative call. We understand there will be no obligation.

Name_____

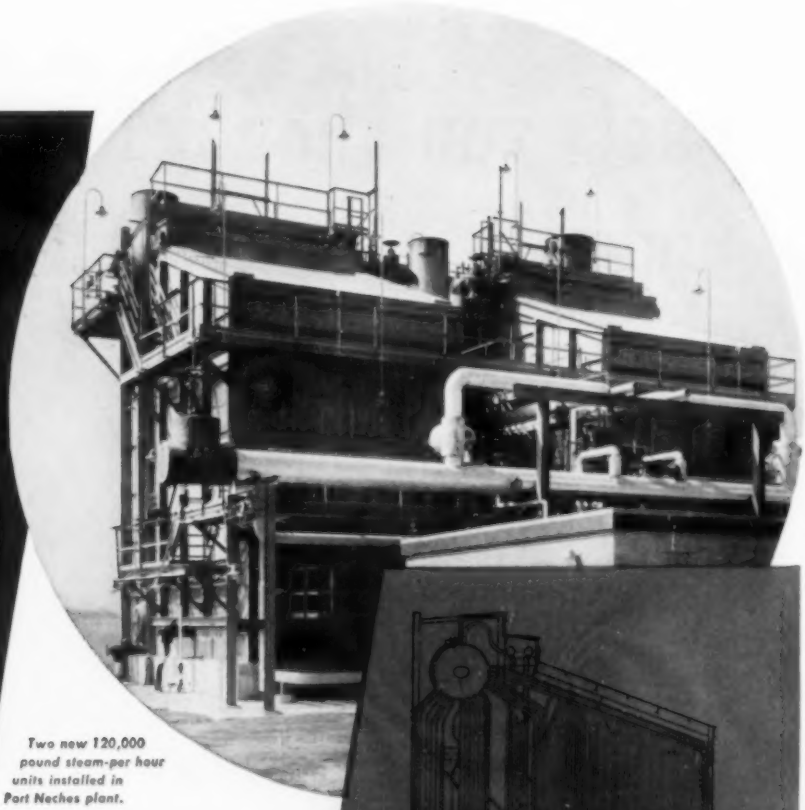
Title_____

Company_____

Street_____

City_____ Zone_____ State_____

# Steam for Jefferson Chemical by Vogt



Two new 120,000 pound steam-per hour units installed in Port Neches plant.

The needed additional power and process steam capacity for Jefferson Chemical's expanded Port Neches plant is furnished by the two Vogt boilers pictured here, each with a capacity of 120,000 pounds per hour. The boilers are designed for 675 lbs. pressure to operate at 625 lbs. pressure and 769°F. total temperature. The furnaces are equipped with gas burners and have water cooled front and side walls.

Bulletins describing Vogt boiler installations in a variety of industrial plants for power, processing and heating are available on request.

*Installation by C. F. Braun and Co., Engineers.*


*For Custom Installation Bulletin VF-VS-2 • Package Unit Bulletin PSG-3, address Dept.* 24A-BS.

**HENRY VOGT MACHINE CO., LOUISVILLE, KENTUCKY**

SALES OFFICES: New York, Chicago, Cleveland, Dallas, Camden, N.J., St. Louis, Charleston, W.Va., Cincinnati


Custom Built By..

**STEAM GENERATORS**

Vogt

## *Southern News Briefs*

(*Continued from page 62*)

alloy used in the construction of nuclear reactors. Columbia-National has a contract with the Atomic Energy Commission for the supply of 700,000 pounds of zirconium sponge annually.

### Multi-Million Dollar Expansion — S. C. Plant

**Wunda Weve Carpet Company, Greenville, S. C.,** is currently conducting a $1,488,000 expansion program including construction of three additions to the present plant and production facilities, installation of knitting and tufting equipment and a substantial increase in key production, research, and development.

The first addition to the weaving mill has recently been completed. It includes some 6,000 square feet of space which houses a specially designed boiler and supplementary steam producing equipment necessary in the custom dyeing and for handling carpet finishing processes. Two more building additions are scheduled to follow.

The three-phase construction development plan was adopted so no interruption in production would occur. The new equipment and increase in facilities are designed to double Wunda Weve's present output.

### OG&E Expansion Contract Awarded General Electric

The **Oklahoma Gas and Electric Company** will have the nation's largest combined cycle steam-gas turbine electric power generation station. Contract for an addition, which will add more than 200,000 kw to Horseshoe Lake Station, 20 miles east of Oklahoma City, has been awarded to the **General Electric Company.** Sargent & Lundy, engineers, of Chicago, are being engaged by General Electric to design the plant. Announcement of the new addition was made jointly by Donald S. Kennedy, Chairman of the Board and President of OG&E, and Clarence H. Linder, Vice-President and Group Executive — Electric Utility Group, General Electric Company.

When completed in 1963, the combined cycle plant is expected to be at least 4 per cent more efficient than a comparable conventional power plant of similar capacity.

Mr. Linder said that General Electric views the combined steam-gas turbine cycle as one of the most significant developments in electric power generation in the past decade, comparable to the introduction of reheat for steam turbines. In the combined steam-gas turbine cycle, the gas turbine not only supplies power for its own generator, but also supplies preheated combustion air to the boilers, where the exhaust heat is utilized.

Oklahoma Gas & Electric pioneered in the installation of gas turbine units for electric power generation in the United States. Two 3500 kilowatt General Electric units installed in 1949 and 1952 at OG&E's Belle Isle Station are the subject of study for engineers from all over the world investigating new techniques in power generation.

OG&E serves a substantial portion of the State of Oklahoma and West-

(*Continued on page 66*)

ern Arkansas including Fort Smith. Its service covers 30,000 square miles. More than 1,100,000 people reside in the 261 communities which it serves. The company also wholesales electric power to 12 other communities. It had 337,050 customers at the end of 1959, and a generating capacity of 1,138,000 kilowatts.

## 1960 Power Conference

The 1960 National Power Conference sponsored by the Power Divisions of the **American Institute of Electrical Engineers** and the **American Society of Mechanical Engineers**, will be held at the Bellevue Stratford Hotel, Philadelphia, Sept. 21-23.

Six sessions at which 19 papers will be presented, and a panel discussion on the advancement of power engineering, constitute the technical program. Sessions will be on coordination of generation and transmission operations, service requirements for industrial customers, power plant automation and advancements in economic power production.

Inspection trips are planned to the Eddystone Station of the Philadelphia Electric Company, the Westinghouse Electric Corp. steam turbine plant, and General Electric Company's switchgear plant.

## Chemstrand Facilities Consolidated — Ala.

**Chemstrand Corporation** announced the consolidation of Engineering and Development offices in Decatur, Ala. The move involves relocation of about 100 employees previously based at the Pensacola, Fla., nylon plant. R. E. Wright is director of Engineering and Development.

Facilities to be occupied will be vacated by the company's Research Center, when it is transferred to the North Carolina Research Triangle Park by early 1961.

## Leeds & Northrup, Fla.

The City of **Jacksonville, Florida,** has awarded to **Leeds & Northrup Company,** Philadelphia, a contract totalling approximately $125,000 for a new electronic brain which will enable the city to produce more power from less fuel.

Known as an advanced generation controller, it will cut costs by maintaining each unit as its most economical operating level regardless of load demand. The controller will also evaluate whether the municipality can sell power at a profit through a tie-line system with neighboring utilities.

Reynolds, Smith and Hills of Jacksonville are consulting engineers for the project.

Southeastern District Sales Engineers from Atlanta and Jacksonville who attended the Mundet general sales meeting. Shaking hands with J. J. Mundet, chairman of the board and president (right) is Clifford Long, branch manager. Looking on are (l. to r.) Fred E. Shroyer, David N. McKinney, Robert C. Branton, W. L. McCord, Charles P. Bragg, Melvyn Bowles, James E. Choate, Jr., Charles H. McDaniel.

## S. E. Sales Engineers Attend Mundet Meeting

**Mundet Cork Corporation,** one of the world's principal cork companies and insulation manufacturers, recently held its first general sales meeting in the company's 67-year history. Over 100 sales engineers attended the three day meeting at the Hotel Roosevelt in New York; one day of the meeting was devoted to a tour of the company's North Bergen and Hillside, N. J., plants.

The meeting is one of the first steps by J. J. Mundet in a plan to embark on an aggressive sales program by the company. Mr. Mundet was elected Chairman of the Board and President of the company in June. This action marked his return to control of the company after an absence of 11 years. During that period, he spent the greater part of his time in supervising the build-up of operations throughout the world.

## Panellit — Baton Rouge

Alfred E. Miller, Sales Application Engineer, will head the new Baton Rouge, Louisiana office of **Panellit,** a Division of ISI, Incorporated, at 635 Laurel Street. The office will handle sales and service on Panellit's process control equipment, and on the parent firm's computers and data loggers, as well as engineering services provided by Panellit Service Corporation to the processing and utility industries.

Mr. Miller is a Registered Professional Engineer and a graduate of Southwestern Louisiana Institute.

## Association Appointments Virginia and Georgia

Robert W. McKinnon, who had been executive secretary of the **Public Utilities Association of the Virginias** since 1952, is the newly appointed assistant director of the **Southeastern Electric Exchange** with headquarters in Atlanta, Ga. He is a native of Charleston, W. Va., and had previously served as assistant director of the West Virginia Industrial and Publicity Commission.

Mr. McKinnon has been succeeded at Roanoke by Donald M. Jones, whose appointment became effective Aug. 1. Mr. Jones was formerly administrator of the American Red Cross Appalachian Regional Blood Center.

(*Continued on page 68*)

GOOD NEIGHBOR POLICY IN PLUMBING:

# How the boiler room of the Hudson Bay High School also serves the school across the street

*And a neighborly boiler room it is! From it, 100,000 feet of USS National Pipe, in the form of steam heat, plumbing, air and fuel lines, serves not only the Hudson Bay High School, Vancouver, Washington, but is used to pipe steam across the street to a vocational school, too. USS National Pipe in sizes from ½-inch through 12 inches was used.*

*Do you need quality pipe for power, heating and air conditioning installations? You'll get it when you ask for USS National Steel Pipe. If you'd like further information, or immediate assistance with your pipe problems, write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.*

USS and National are registered trademarks

Steel

This mark tells you a product is made of modern, dependable Steel.

Plumbing & Heating Contractor: Longview Plumbing & Heating Company. Mechanical Design: J. Donald Krocker & Associates, Consulting Engineers.

*The world's largest and most experienced manufacturer of tubular products.*

USS **National Tube Division of United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors
United States Steel Export Company, New York

# *Southern News Briefs (Continued)*

## Cooper-Bessemer — Texas

R. M. Boone has been transferred to **The Cooper-Bessemer Corporation's Odessa, Texas** office, where he will work with C. L. McDougall,

Odessa branch manager, on the application and sales of Cooper-Bessemer compressors and engines in that area.

Since 1957, Mr. Boone has been assigned to the sales department at the company's headquarters in Mount Vernon, Ohio. He is an industrial engineering graduate of Texas A&M College.

## Hays Corp. — Tex., La.

**The Hays Corporation,** Michigan City, Ind., recently announced two new appointments. A. A. Harrison, formerly at the main office, has been

named Southern regional sales manager with headquarters at Houston, Texas. His territory includes Texas, New Mexico, Alabama, Florida, Georgia, Louisiana, and Mississippi.

H. R. Gilbert Company, New Orleans, La., has been appointed sales representative for The Hays Corporation. Mr. H. R. Gilbert, who heads his company, has long been active in the field of instrumentation.

## Lewis-Shepard — Tenn.

The appointment of Richard H. Johnson, Jr., Johnson Brothers as its exclusive sales and service representative in the Knoxville, Tennessee territory has been announced by **Lewis-Shepard Products, Inc.,** Watertown, Mass., producers of electric fork lift trucks and related materials handling equipment. Johnson Brothers is located at Anderson Road, Knoxville, Tennessee.

## R T & E Corp. — Texas

D. M. Parrish, of Dallas, Tex., has been named manager of **R T & E Corporation's** new distribution transformer plant in Arlington, Tex.

Mr. Parrish has been a manufacturer's agent for R T & E since 1948. Before then, he was midwest sales manager for the James R. Kearney Corp., of St. Louis, Mo.

## Stone & Webster Elects Southerners

**Stone & Webster Service Corporation** recently announced election of Frank C. L. Sperry and Edgar M. Hawkins, Jr., as vice-presidents of the management consulting firm.

Mr. Sperry, who was also elected president of Conversions & Surveys, Inc., a subsidiary of the Service Corporation, had at one time been associated with the Atlanta Gas Light Company. He is an engineering graduate of the University of Texas. He now lives in Darien, Conn.

Mr. Hawkins has served in managerial capacities with Virginia Electric & Power Company and the City of Danville, Virginia. He also lives in Darien.

## Stromberg-Carlson — Ga.

Robert E. Poole, Jr., has been appointed an industrial sales representative in the Atlanta Branch of **Stromberg-Carlson's Telecommunication Division.** Stromberg-Carlson

is a division of General Dynamics Corporation.

Mr. Poole will serve major industrial and governmental procurement agencies in the Southeast territory, under the direction of W. L. Mollands, Atlanta Branch sales manager. He will be responsible for the sale of telecommunication equipment and components, including carrier/microwave systems, supply materials and industrial type products.

## I-T-E — Charleston, W. Va.

Daniel E. McDade has been named manager of the new Charleston, W. Va., district office of **I-T-E Circuit Breaker Company,** Philadelphia.

He will handle sales in southwestern Virginia, southern West Virginia,

eastern Kentucky and southeastern Ohio. I-T-E products include such items as circuit breakers, switchgear, transformers, rectifiers, power switching centers, metal-enclosed bus and low-voltage distribution equipment.

The new office is at the Nelson Building, Room 301, Kanawha Boulevard at Broad, Charleston 27.

## General Electric — Fla.

Frederick L. Rauch, veteran of 25 years with **General Electric Service Shops,** has been appointed manager of the company's shop at Jacksonville, Fla.

The new building, on Beaver Street just west of Stockton Street, opened in June. The shop handles electrical and mechanical repair of equipment ranging from turbine generators and large industrial motors down to fractional horsepower motors, meters and instruments.

## Allis-Chalmers — Mo.

W. M. Johnson has been appointed manager of the utility section of **Allis-Chalmers'** St. Louis district.

Mr. Johnson joined the company's St. Louis office in 1945.

## Cleveland Electric Co. Offers New Service — Ga.

**Cleveland Electric Company,** 557 Marietta St., N. W., Atlanta, Ga., is now offering, in addition to contracting and motor service, complete industrial electronic control service and panel fabrication.

The newly organized Electronic Control Department provides qualified control technicians on call 24 hours a day for service of electronic equipment. Cleveland Electric is the authorized field service station for the Reliance Electric and Engineering Company.

# NEW Product Briefs

*. . . there is always a BETTER WAY*

## A New Design Storage Rack

T-1 The new Ridg-U-rak, manfactured by **Bernard Gloekler North East Company,** features only two basic parts — the welded upright frame and the stringer. Each stringer has integral double engaging hooks at each end that fit into slots spaced 4 inches apart on all vertical columns. The external locking flange is provided the full length on both sides of vertical columns. Shown above is a recent installation of a "Ridg-U-rak" Storage System installed at the Wilkins Coffee Company, Washington, D. C.

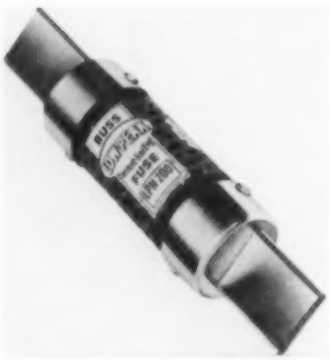
## Solvent Additive

T-2 A new solvent additive, designed to speed the removal of unusually stubborn compounded soils, has been introduced by **Oakite Products, Inc.,** 19 Rector St., New York.

The new "Acalaid," added in the range of 5 to 10 per cent by volume to the company's acidic or alkaline solutions, increases their power and efficiency. It is economical, because it is used only where needed to boost standard solutions; and it may eliminate the need of more concentrated and more expensive cleaners. It may be used in tanks at temperatures between 140 and 160 F; and in closed systems at temperatures between 180 and 200 F.

## High Interrupting Fuse

T-3 **Bussmann Mfg. Division's** Low-Peak Fuses are reported capable of safely interrupting fault currents up to 200,000 amperes, limiting let-through current to exceptionally low values and holding 500% load for minimum of ten seconds.




Circuits can be fused close to their normal current load and motor-starting currents or other harmless overloads will not cause the fuse to blow. Yet, on heavy fault currents, the fuse opens so rapidly the fault current cannot build up to a damaging peak. Let-through current is restricted to safe values, protecting circuit components against thermal and mechanical stresses.

## Disposable Filters

T-4 Especially developed to operate at the lowest pressure drop and still provide the highest efficiency and dirt holding capacity, the deep-pleat design of **Farr Company's** new HP filter provides larger media area in a compact, preformed, folding filter cartridge.

The new series of disposable media filters is comprised of 3 interchange-

able cartridges in 3 atmospheric efficiency ranges. The HP-100 is in the 85% range; the HP-200 in the 95% range. The HP-2 cartridge is in the 35% range.

Thoroughly tested in the laboratory and under actual operating conditions, Farr HP filters are designed for any commercial or industrial ventilating or air conditioning system requiring high efficiency air filtration with low maintenance costs. The folding media consists of a reinforced material of extremely fine glass fibers in the HP-100 and -200 series (see illustration). HP-2 media is reinforced, non-woven cotton fabric.

## Coating for Damp Surfaces

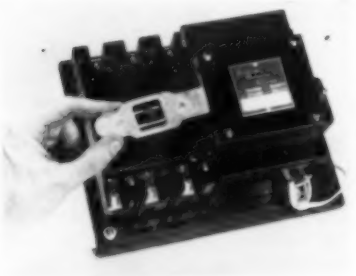
T-5 A new "Super Dampcoat" enamel is now being marketed by the **Wilbur & Williams Co., Inc.,** Norwood, Mass. Formulated specifically for application right over heavily "sweating"

surfaces, the coating withstands the destructive action of chemical corrosion.

Being an all synthetic product, it contains no organic host for fungus, and has very low odor which affects neither food products nor applicators. Non-toxic and resistant to most acids and alkalis, this new coating is extremely hard and tough with high gloss retention. It is available in 6 colors plus white in full gloss; in white flat and 2 semi-gloss finishes.

### Electrical Operators

T-6 A line of electrical operators that allows Type AB circuit breakers to be remotely controlled is now available from the **Westinghouse Electric Corporation.**



Models with rated control voltages of 120, 240, 480, or 600 volts a-c and 125 volts d-c can be supplied. They will actuate breakers rated to 100 amperes at 600 volts in frame sizes designated E, EH and F.

The electrical operators can be used for a variety of remote control applications involving equipment such as engine generators, battery chargers, irrigation and oil field pumps, and lighting. They can also be used for capacitor-bank switching, as a limited duty motor starter, or as an overload sensing device.

### Metal Treatment

T-7 A new drying agent has been added to "Ospho" metal treatment by **Rusticide Products Company,** 3125 Perkins Ave., Cleveland 14, Ohio. In the average application, drying time is reduced to approximately half the 12 hours formerly required.

"Ospho" is applied directly on rusted metal, eliminating the need for extensive surface preparation. It chemically changes rust (iron oxide) into iron phosphate, an inert surface which provides an excellent base for regular maintenance paint.

## *New Products (Contd.)*

### Plastic Steel

T-8 Mounting junction boxes without drilling — without screws — without nails is now possible through the use of Plastic Steel, a product of **Devcon Corporation**, Danvers, Mass.

A combination of 80% steel and 20% extra strength epoxy plastic, this material will bond junction boxes and other fixtures to steel beams or machinery, wood, cinder block, brick, and concrete — quickly, easily, and permanently. The resultant bond is stronger than the concrete itself.

No heat or pressure is required. Just mix the Plastic Steel and hardening agent and apply to the back of the box. The box is then positioned against the wall and supported until the Plastic Steel has hardened. In about one hour the box can be wired in the usual way.

Plastic Steel and other Devcon products are available from industrial distributors and hardware wholesalers.



### Rollout Switch & Fuse

T-9 Major redesign of **General Electric** rollout switch and fuse equipment has placed emphasis on ease of operation and safe, uncomplicated maintenance.

New, simplified stored-energy mechanism can now be quick-charged with a single stroke of the operating handle. Quick-break tripping action results in less arc time — gives greater contact life.

### Small-Size Reducer

T-10 **Foote Bros. Gear and Machine Corporation** has begun marketing a new line of small-size worm gear reducers, featuring center distances as low as 1⅛". The "Radicon Reducers" are available immediately from stock.

The new units are designed to complement the wide range of gear reducers now manufactured by Foote Bros., and to provide distributors with a broader product base under the firm's new marketing program.

## Chain Wrenches

T-11 Two new chain wrenches introduced by **The Ridge Tool Company** of Elyria, Ohio, are designed especially for work in extra tight quarters. They feature fast, ratchet-like action in

either direction . . . from either side. Chain gives tight grip without crushing on all round, square or irregular shapes. Tempered steel link chain has large easy-to-grab finger ring for fast adjustment. Chain catches quickly and securely on double lugs.

Two models are presently available. No. C-14 handles up to 2" pipe and fittings; No. C-18 up to 2½" pipe and fittings. As in all other RIGID Wrenches, sturdy, comfort-grip I-beam handle is made of alloy malleable and is guaranteed not to warp or break.

## Anti-Seize Compound

T-12 **Lehigh Chemical Company,** Chestertown, Maryland is marketing a synthetic anti-seize compound for extremely high temperature applications.

Called Anderol L-751, it is a mixture of a thermally stable silicone oil with a solid type lubricant blended to the consistency of a medium soft grease. Its excellent thermal stability and anti-weld properties meet the requirements for high temperature ranges of 400 F to 600 F.

## Specialty Primer

T-13 A specialty cold-applied, inhibitive primer for use in contaminated industrial or marine atmospheres has been formulated by **Koppers Co., Inc.,** Pittsburgh 19, Pa.

The new Bitumastic 11-S, serves as a shop primer to prevent contamination from attacking the surface before the protective coating can be applied; and to avoid undercutting where mechanical damage produces breaks in the protective coating, after applied.

# New Product Briefs (Continued)

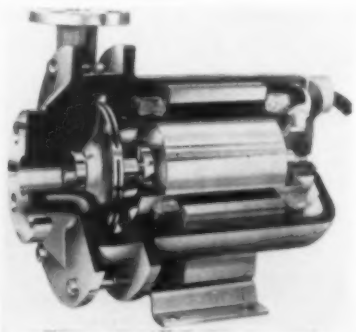
## Narrow Aisle Electric Truck

T-14 The heavy duty narrow aisle electric truck, manufactured by **Raymond Corp.**, is now offered with a single drive wheel and offset caster.


Development of the single wheel drive enables the company to sell the new model at a lower price while retaining most of the features of the original unit. Both trucks are designed for applications requiring fast lifting speeds and continuous operation handling loads up to 4,000 lb. The hydraulic lift is driven by an 8-hp motor operating from the large 24 volt battery which powers the truck.

## Canned Pumps

T-15 **The Moyno Pump Division of Robbins & Myers, Inc.,** Springfield, Ohio, has introduced a line of canned pumps designed for leak-proof handling of dangerous or expensive fluids.

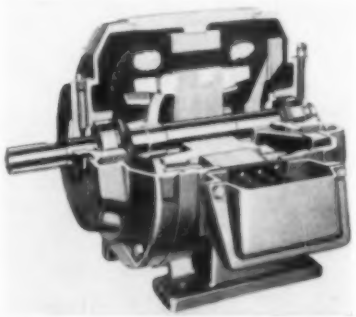


The new unit is a completely self-contained motor-pump in which the material being handled circulates within the motor. The pump impeller is connected directly to the motor shaft. Accordingly, no seals, packing or stuffing box are required and the pump is thereby completely leak-proof.

The motor rotor and field are encased in stainless steel "cans," heliarc welded during fabrication to isolate them from the material being pumped. The pumped fluid lubricates the entire unit.

## Encapsulated Motor

T-16 A completely new line of open weatherproof a-c motors with an epoxy encapsulated insulation system has been introduced by **Reliance Electric and Engineering Company**, Cleveland. The new Duty Master Weatherproof Motors are currently available in frames 180 through 445U (1 through 125 horsepower) in all standard speeds and voltages.



The stator windings are thoroughly encapsulated in a specially formulated epoxy resin for resistance to moisture, oils, dust, chemicals, acids and alkalies. The bearings, exposed internal metal surfaces, hardware, and mechanical parts are also protected against damage from contaminating atmospheres.

The full Class "B" insulation system is built around the thixotropic (it won't change form with heat) epoxy resin which is applied by a vacuum impregnation process. The system employs polyester round copper magnetic coil wire, epoxy-insulated glass fibre sleeving, epoxy-treated glass fibre cloth slot liners and phase insulation. Separators and top sticks are glass mat base epoxy resin laminate, and lead cable is protected by moisture-proof silicone rubber.

## Static Trip Device

T-17 A new static overcurrent trip device with no moving parts has been announced for **Allis-Chalmers** Type LA low-voltage circuit breakers to provide greater accuracy, reliability and more desirable tripping characteristics than existing oil or air time delay devices.

Self-contained, the new device requires no external source for tripping. Timing and tripping are performed by the static trip units energized from tripping transformers mounted on the circuit breaker.

The static tripping device has an 80 to 200 per cent variable pickup and an instantaneous pickup which is adjustable from 4 to 30 times the minimum pickup setting of the breaker, as compared with 500 to 1,500 per cent now available, to provide instantaneous response at lower or higher values of short circuit current.

## "Lo-Loss" Flow Tube

T-18 A completely new design "Lo-Loss" Flow Tube, as a differential producer for accurate measurement of flow, with lowest head loss and highest recovery, is announced by **Burgess-Manning Company**, Penn Instruments Division.

With its new short, compact length, installation of the flow tube can be easily made on horizontal, vertical or inclined lines.

For use with clear water, sewage, sediment bearing liquids, trade wastes, air or gases, the flow tube is available in cast iron, bronze, stainless steel, plastic or any specified material, and can be formed, cast or fabricated to meet special requirements.

(*Continued on page 76*)

## New Products (Contd.)

### Foam Insulation

T-19 **Mobay Chemical Company** is supplying basic urethane chemicals for a new all-purpose industrial pipe insulation called Thermax. Designed to insulate any pipe from -300 F to 275 F, the product is cutting plant site installation costs as much as 25%, according to the manufacturer, **American Cellular Co., Inc.**

Fabricated of urethane foam specifically engineered for insulation applications, Thermax is constructed with a longitudinal seam which allows it to spread open to receive the pipe and, upon release, to snap quickly into the designated position. This easy-installation feature, plus the fact that Thermax weighs only a fraction of other pipe insulators, accounts for the initial savings.

Due to its low K factor and longevity, Thermax is recommended for industrial cold processing plants and commercial and institutional refrigeration systems where sub-zero conditions are the rule.



### Short Leg Clamp For Structural Use

T-20 A new material handling device, manufactured by **Merrill Brothers** and known as the Merrill 2-ton Structural Clamp was designed with a "short leg" feature in order to provide a secure bite on even small junior size beams. The use of this clamp eliminates time lost in slinging, attaching and releasing work in the process of moving.

Completely drop forged, the clamps are extremely light in weight in relation to their capacity. They have a grip range 0-1"; are 100% proof tested at 6 tons and have a safety factor of 5 to 1.

### Fluid Drive for On-the-Shaft Feed Pumps

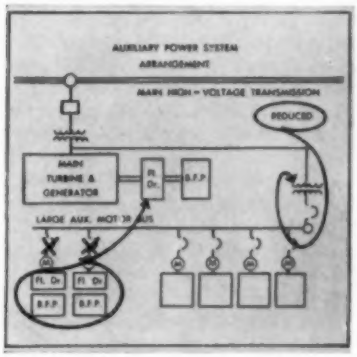
T-21 A new line of adjustable speed fluid drives, developed specifically for use with "on-the-shaft" boiler feed pump drive arrangements, is available from **American-Standard Industrial Division,** Detroit 32, Michigan. "On-the-shaft" refers to the arrangement whereby the boiler feed pump is driven directly from the main turbine generator shaft.

The Class 7 units are designed for use with any size boiler feed pump. Standard units are available for either 3600 rpm or 1800 rpm operating input speed.

A practical solution to the problem of reducing auxiliary power demands in boiler feed pump drives is to drive the pumps directly from

the main turbine generator shaft through an adjustable speed drive. This arrangement is designated as the "on-the-shaft" method. The new fluid drives have been specifically engineered for on-the-shaft operation. An older design has been widely used for years in motor-driven feed pump applications.

On-the-shaft fluid drive applications provide multiple savings. Mainshaft driven pumps eliminate costly electrical accessories normally required with motor-driven pumps. Auxiliary demands are reduced, permitting release of more power to consumer lines. Further, an on-the-shaft installation can result in lower capital costs and lower operating costs.




Use of on-the-shaft boiler feed pump drive in this typical auxiliary power system arrangement eliminates two high horsepower motors and accompanying switchgear. It also permits reduction in the size of the transformers and switchgear serving the main auxiliary bus bar.

## Wet Wood Stoker

T-22 A new wood-burning stoker for use in woodworking plants, including sawmills, veneer and plywood operations, is now being offered by the **American Coal Burner and Wood Stoker Corporation.** 1133 W. Cornelia Ave., Chicago 13, Ill.

This "Flo-matic Model W" can burn hogged green and wet wood refuse, kiln-dried planer chips and sawdust. The same machine can be equipped with a proportioning screw arrangement to include the burning of coal.

The hopper can be placed so that, where necessary, gas or oil burners can enter furnace through the front wall. When burning gas or oil as supplementary fuel, the furnace is equipped with a refractory forced draft hearth that practically does away with grate maintenance.

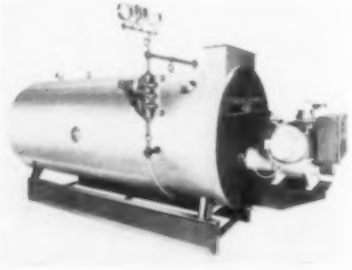
(*Continued on page 78*)

# New Product Briefs (Continued)

## Combined Panelboards

T-23 Ratings of **Square D Company's** line of NQO panelboards have been expanded so that protection for power loads can now be combined in the same panelboard with lighting and appliance circuits.

Available from distributor stock, these panelboards feature plug-in construction for on-the-job assembly. The basic devices are available with main lug ratings up to 600 amperes. Type QO and Q1 plug-in branch circuit breakers are offered in one, two or three-pole construction with ratings from 15 to 100 amperes. Both the basic device and circuit breakers feature heavy-duty industrial construction.



## Boiler-Burner Plant

T-24 The first automatic boiler-burner plant designed by a burner manufacturer for maximum efficiency at a given boiler rating has been introduced by **Industrial Combustion, Inc.**, Milwaukee, Wisconsin. The scotch-type, two-pass "Highlander" plant is available in 21 sizes.

Heart of the plant's efficiency is one of Industrial Combustion's standard line of burners: Hev-E-Oil, Hev-E-Duty power gas, or Hev-E-Duty combination gas-oil burner. The Hev-E-Oil burner is designed especially for operation with inexpensive number 4 and 5 heavy oils, as well as number 6 or Bunker C oil in the larger models, and ranges in capacity from 5 to 150 gallons per hour. The Hev-E-Duty power gas burner uses from 720,000 to 21,000,000 maximum Btu natural or LP gas input per hour.

One gas-oil burner combination takes from 5 to 150 gallons of light oil per hour, or from 720,000 to 21,000,000 maximum Btu gas input per hour. Another combination burns from 5 to 150 gallons of heavy oil per hour, or from 720,000 to 21,000,000 maximum Btu gas input per hour. Fuels in either combination are changed without any mechanical burner modification, usually by just flipping a switch.

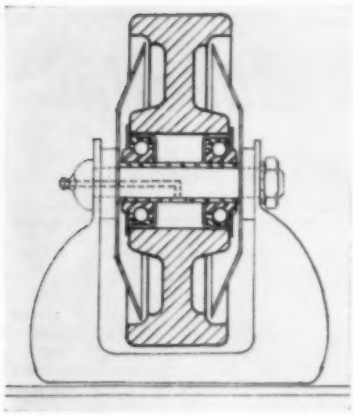
The complete plant is manufactured to ASME standards for 125 or 150 pound steam pressures. Capacity ranges from 10 to 460 horsepower. Outputs based on 5½ square feet of heating surface per bhp are certified S.B.I. ratings. Both boiler and burner are mounted on one frame. Wiring, piping, gages, and controls are also integrated.

## Textile Casters

T-25 A solution for the elimination of the binding action of thread and lint on the wheel of a textile caster is offered by the **Fairbanks Company** of 393 Lafayette Street, New York 3, N. Y.

Two direction protection is achieved by the design of a precision cast semi-steel wheel. A step is cast on the web of the wheel so that in addition to the tight fit of the periphery of the thread guard to the concentric inner surface of the wheel tread, there is the right angle protection of the tight fit of the thread guard to the step. The step on the web also protects the thread guard by preventing deformation due to blows and impacts.

Caster is assembled with spacer washers between the thread guards and the legs of the caster. It can be cleaned out without the need of re-



moving the wheel. The wheels are standard with ball bearings.

The textile casters are also available with Fairbanks all-plastic Lamilon wheels, fitted with ball bearings and a thread guard embodying the same type of protection against binding.

### Automatic Zone Valve

T-26 A new, automatic valve, Type ZV, for zone control of hot water, steam, and radiant heating systems has been announced by **Sarco Co., Inc.,** New York, manufacturers of temperature regulators, steam traps, and heating specialties.


The automatic zone valve is designed for heating and cooling applications utilizing fan coil units, thereby providing inexpensive individual control of room temperature. Operating on 24-volt a-c, the device features a thermostat-actuated valve that responds to temperature demand and simultaneously controls the operation of circulator or burner.

(*Continued on page* 86)

# NEW Catalogs & Bulletins

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**MAINTENANCE—TOOLS EQUIPMENT & METHODS**

**3—Metallizing** — Use industry's low-cost "putting-on" tool. Now within reach of the smallest shop. Bulletin tells you how you can spray carbon steels, stainless, babbitts, brass, nickel, aluminum, etc. — METALLIZING ENGINEERING CO., INC.

**6—Tool Truck** — Save time with this compact truck carrying full tool selection to emergency repair jobs. Four drawer unit described in literature 8141-A. Semi-pneumatic 10" balloon tires ease heavy loads over rough pavements. — SNAP-ON TOOLS CORPORATION.

**22—Lubricator Alert** — Data sheet describes lubricator flow switch that indicates positive flow at terminal points on any force feed lubricator system. Easily installed on any existing application. Indicates lack of flow to the point of injection. — MANZEL.

**27—Corrosion Control Systems** — Five-step procedure outlined in Brochure 9111 for primary protection and preventive maintenance of all metal surfaces subject to acids, alkalis, solvents, fumes and gases. — TRUSCON LABORATORIES.

**34—Floor Maintenance** — 4 page catalog describes metallic, asphalt, latex, epoxy and other products for hardening, resurfacing and patching concrete or wood floors. — A. C. HORN COMPANIES.

**35—Stop Corrosion** — 4 page bulletin tells how Alkasteem neutralizes carbon dioxide and Ox-Gem reacts with oxygen to stop corrosion in boilers, heaters, condensate returns, steam lines and traps. — ANDERSON CHEMICAL COMPANY, INC.

**37—Maintenance Gun** — Brochure describes the Von Arx Air Gun — lightweight tool for tough cleaning, de-scaling and de-rusting jobs. Air-operated reciprocating needles adjust to contours automatically. Three sizes. Comes in handy kit with accessories. — MARINDUS COMPANY.

**38—Heavy-Duty Wrench Set** — Bulletin 8141-C details the Loxocket 521-EHD-B. Metal case containing 17 sockets from 1 7/16" to 3⅛", ratchet, sliding bar and two extensions — 8" and 16" — ready to go on any assignment.—SNAP-ON TOOLS CORPORATION.

**41—Roof Coating**—Booklet "Natural Rubber — its effect on exposed roof and masonry surface" plus information on durable asphalt protective coatings for roofs. — GARDNER ASPHALT PRODUCTS CO.

**53—Steam Line Treatment** — Folder describes alkaline IPCO S-L-T. Used in boiler water, it will volatilize and travel with steam to return lines. Prevents costly repairs and provides insurance against replacing pipe and fittings. — IPCO LABORATORIES, INC.

**75—Storage Racks** — How you can build them faster with Kee Klamp slip-on fittings described in Catalog K-25-D. Allen wrench only tool needed. Simple to erect; easy to dismantle. 58 varieties for pipe sizes ⅜" to 2". — KEE KLAMPS.

**78—Control Heat & Glare** — New folder tells how Sun-X Glass Tinting (transparent alkyd-based liquid plastic by DuPont) is applied directly to existing glass by flow process without spray or splatter. Bonds tightly. Wash in usual manner. — AMERICAN GLASS TINTING CORP.

**94—Corrosion Control** — Booklet, 20 pages — "Corrosion Control of Electric Light and Power Structures and Equipment" is designed to give company field operating men practical painting information on all phases of transmission and distribution work. Applicational photographs. — SUBOX, INC.

**95—Plant Lubrication** — The Lubriplate Service Handbook — Gives valuable information on the subject of lubrication in all its forms, intended to be of everyday use to plant superintendents, managers, maintenance engineers and those in charge of plant production and maintenance. — LUBRIPLATE DIVISION, FISKE BROTHERS REFINING CO.

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806 Peachtree St., N. E.
Atlanta 8, Ga.

## Bulletins (Cont.)

### FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**143—Chemical Feeders** — 36 page Bul. 1136 describes metering pumps — types, construction, displacement and operating pressures. Gives handling recommendations for chemicals, acids, etc., and volumetric conversion tables. — MANZEL.

**157—Pumps for Corrosive Liquids** — 4 page Bulletin 5252-J describes 8 centrifugal pumps particularly adapted for handling corrosive liquids. Useful chart shows materials of construction available. Sizes, ratings, etc., briefed. — GOULDS PUMPS, INC.

**160—Boiler Feed Pumps** — 12 page Bulletin 122 describes and illustrates the type BFI high pressure pumps. Design features, service ratings and engineering data included. — PACIFIC PUMPS, INC.

**165 — After Cooler** — Bulletin 130 shows how the Aero unit removes moisture from compressed air or gases; cools water for jackets and intercoolers; cools air or gases in both power and process systems; and protects air tools and pneumatic systems from water damage.—NIAGARA BLOWER COMPANY.

**169—Airfoil Fans** — Bulletin 179 covers complete line of Airfoil mechanical draft fans for forced and induced draft featuring wide range of pressure-volume ratios, high efficiency, low noise level, rugged construction. — GREEN FUEL ECONOMIZER CO.

**182—Centrifugal Fan Equipment.** — Catalog 515 covers complete, ready-to-run centrifugal fan equipment. Capacities 400 to 14,000 cfm. V-belt and direct drive units. Universal discharge feature. Available for outdoor installation.—CLARAGE FAN CO.

### INSTRUMENTS—METERS CONTROLS—REGULATORS

**212—Self-Powered Controls** — Bulletin 620 describes self-powered automatic temperature regulators — no compressed air or electrical wiring required, no delicate mechanisms to adjust, no packing glands to stick, no shut-down due to power failure. — SARCO COMPANY, INC.

**231—Control Valves** — Catalog No. 305 illustrates and describes construction and specifications for a wide line of air operated diaphragm control valves suitable for the majority of general process applications and plant services. — MASON-NEILAN.

**243—Multi-Pointer Indicator** — 4 page Product Specification P11-1 illustrates group of individual miniature vertical gage units. Gives details of pointer movement, 3¼ in. scale design, and optional internal illumination. — BAILEY METER CO.

**244—Desuperheaters** — 4 page Bulletin 1024-A describes steam-assist desuperheating. Charts show the close control of temperature which is possible during wide load fluctuations. Schematic diagrams of piping arrangement and control systems. — COPES-VULCAN DIV.

**253—Combustion Analyzer** — 4 page Specification E65-5 describes the "Heat Prover" which indicates per cent by volume oxygen and combustibles present in exhaust gases from all types of boiler and industrial furnaces. — BAILEY METER COMPANY.

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**265—High Pressure Water Columns** — Brochure BO — Introduction to high pressure (251 to 2500 psi) division of catalog data. Describes construction of higher pressure water columns; gives reference list of gages and supplementary equipment. — RELIANCE GAUGE COLUMN CO.

**287—Color-Port Water Gage** — Bulletin WG-1814 describes the new gage for high pressure boilers (up to 3300 psi). Gives full details on design and operation and shows how it gives greater visibility and greatly reduced maintenance requirements. —YARNALL-WARING COMPANY.

### PLANT CONSTRUCTION—WELDING EQUIPMENT—SPECIALTIES

**300—Buyer's Guide** — Up-to-date industrial and maintenance building products stock list. Includes complete listing of all Rasco distributed products plus branch locations. — REYNOLDS ALUMINUM SUPPLY CO.

**307—Condensate Drainage Control**—Publication 6025 describes units for improving quality of heat transfer in process equipment through continuous return of condensate to boiler at high temperature and pressure. Lists many cases substantiating claim for increased heat transfer, more production with less fuel.—COCHRANE CORPORATION.

**317—Drier Compressed Air**—Bulletin 130 shows how Aero After Cooler cools compressed air or gas below temperature of surrounding atmosphere; no further condensation in your air lines. Installed outdoors. Saves cooling water. Gives better operation of air-operated tools, etc. —NIAGARA BLOWER COMPANY.

**326—Beam-Type Guardrail**—Manual FB-3456 describes how Flex-Beam Guardrail protects danger spots along roads, highways, bridges, and in industrial plant locations. Installation photos, drawings, reference data, dimensions and physical properties. — ARMCO DRAINAGE & METAL PRODUCTS, INC.

**330—Elevated Water Storage** — 4-color catalog describes the Aquatore — a new elevated water tank design with capacities from 300,000 to 3,000,000 gallons. Many design advantages including no struts or tie-rods. — GRAVER TANK & MFG. CO.

**365—Storage Water Heaters** — Gas-fired, Scalefree 230 units described in Bulletin 4. Fully automatic package requires only simple connections. Available in more than 100 storage and recovery combinations. Storage capacities range from 250-4,000 gal. — THE PATTERSON-KELLEY CO.

**370—Industrial Fence** — You can eliminate pilferage, control traffic, and improve plant appearance most economically with Anchor Chain Link Fences. Catalog gives case-studies from other plants in South - Southwest. — ANCHOR FENCE.

**386—Rigid Frame Buildings**—8 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bowstring truss all-steel roof systems; fabricated for rapid erection. — ATLANTIC STEEL COMPANY.

**390—Tank Insulation** — An insulated tank is like a giant radiator heating the outdoors — and that costs money. 8-page Ultralite Tank Brochure tells you how you can save over 90% of this heat loss with glass fiber blankets. Can pay for itself in six months to a year. — GUSTIN-BACON.

### PIPING—VALVES—FITTINGS STEAM SPECIALTIES—TRAPS

**401—Steam Traps** — Bulletin 775 gives price, dimension and capacity data on Open Float and Thermostatic Steam Traps for trouble-free heating service.—ARMSTRONG MACHINE WORKS.

**410—Flexible Connectors** — How all-metal connectors absorb piping vibration described in Catalog 1D-100C. Convey corrosives, simplify misaligned hookups & save installation time. Bronze, carbon steel and stainless steel. — UNIVERSAL METAL HOSE CO.

**414—Acid Resistant Pipe** — 4 page technical brochure covers properties of Union 20-S stainless steel. Alloy can be welded and put into service without subsequent annealing. Shows comparative resistance to 94 different corrosive agents. — REYNOLDS ALUMINUM SUPPLY CO. — UNION STEEL CORP.

**416—Control Valves** — Illustrated Cat. 305 contains detailed specifications on air-operated control valves. All usual types are described. Technical data are included as an aid to selection. — MASON-NEILAN DIV.

*(Continued on page 84)*

## Bulletins (Cont.)

**420—Valves** — 24 page Catalog illustrates and describes bronze, iron, steel and corrosion-resistant valves for controlling the flow of water, oil, gas, steam and corrosive fluids. — THE WM. POWELL CO.

**421—Air and Gas Traps** — 8 page Bulletin No. 289 describes complete line of ball float traps for draining water from air, gas or steam lines or draining a light liquid from a gas under pressure (for pressures to 900 lb). Includes: installation, selection and ordering information. — ARMSTRONG MACHINE WORKS.

**458—Stainless Valves**—Catalog gives complete technical data on stainless steel valves for all purposes. Over 100 valves diagrammed and described. — REYNOLDS ALUMINUM SUPPLY CO. — COOPER ALLOY CORP.

**466—Pipe Insulation** — Folder describes Superglas with "hinged action" — made in one-piece, full length sections open easily to speed installation; easy cutting and fitting; temperature limit is 350 F. — MUNDET CORK CORPORATION.

**468—Steam Traps** — 40 page engineering manual aids engineers and maintenance men in sizing, specifying and buying of steam traps and other fluid specialties. All data necessary to engineer a trap installation is included. — V. D. ANDERSON CO.

**472—Desuperheater** — Bulletin 1056 describes a carburetor type desuperheater capable of being controlled to supply steam at a temperature within plus or minus 5 F of plant requirements. Includes structural details, system arrangements of control components, and mechanical specifications. — COPES-VULCAN DIV.

**493—Unions & Valves** — Complete company line of pipe unions and check valves covered in Catalog 56. New Four-Star lug nut unions & spring controlled check valves included. — CATAWISSA VALVE & FITTINGS COMPANY.

### BOILERS—STOKERS TURBINES—BURNERS

**501—Package Boiler**—New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr.—E. KEELER CO.

**502—Feedwater Treatment** — 4 page catalog tells how Braxton and Flako internally condition water so as to remove and prevent scale formation and corrosion in boilers. — ANDERSON CHEMICAL COMPANY.

**503—Free Coal Counseling** — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose.—NORFOLK AND WESTERN RAILWAY.

**526—2-Pass Automatic Boilers** — Bulletin tells how Continental packaged boiler design cuts down on inspection and maintenance costs and keeps down time to a minimum. — BOILER ENGINEERING & SUPPLY CO.

**531—Fuel Oil Treatment** — Data sheet describes how Mogul treatment disintegrates, dissolves and disperses sludge in fuel oil storage tanks and equipment. Through sludge dispersal, maximum vaporization and combustion are possible. — THE NORTH AMERICAN MOGUL PRODUCTS COMPANY.

**532—Economical Steam** — Forced draft, pressurized gas or oil fired units described in SB-59 catalog. Two-drum water tube units include steam trim, draft equipment, burner and combustion safety controls. — ERIE CITY IRON WORKS.



**539—Industrial Burners** — How to keep heating costs low with Hev-E-Oil commercial-industrial burners described in Bulletin SPI-859. Models from 5 to 150 gph; automatic, electronic controls; Hev-E-Duty power gas burners and combination gas/oil burners from 720,000 to 21,000,000 Btu. — INDUSTRIAL COMBUSTION, INC.

**542—Underfeed Stoker** — Illustrated Cat. 401 gives complete data on double retort underfeed stoker built for heavy duty service in intermediate size range for boilers of 20,000 lb to 34,000 lb of steam/hr capacity. — DETROIT STOKER CO.

**549—Firing Systems** — Folder No. 5843 describes industrial packaged forced-draft firing systems for dual-fuel or single-fuel firing of high or low pressure natural, LP or manufactured gas or any grade of oil from No. 2 through No. 6 in Scotch marine, steel firebox, water tube or cast iron boilers. Illustrated.—IRON FIREMAN MFG. CO.

**565—Self-Contained Boilers**—8 page brochure AD-162 describes company's line of Model CB boilers. Highlights design features, fuel flexibility, four-pass, forced draft design, unified electric and steam preheater, quiet vibrationless impeller, and hinged doors with built-in refractory. — CLEAVER-BROOKS CO.

**566—Packaged Combustion Unit** — Completely piped, wired and tested factory assembly described in Bulletin B8/30. Has Kinetic gas burner, manual firing valve, automatic diaphragm gas valve and electronic combustion safeguard system incorporating RA680 cabinet. Available in 3 sizes with 8 capacities from 800,000 to 3,260,000 Btu-hr.—WEBSTER ENGINEERING CO.

**570—Seamless Boiler Tubes** — 44 page Bulletin 12 contains complete description of manufacture, advantages, tolerances, allowable stress and working pressures, bursting strength, weights, steam properties and other data. — NATIONAL TUBE DIV., UNITED STATES STEEL CORP.

**574—Packaged Generator** — Bulletin 582 describes Vapormatic Coil-N-Shell Steam Generator for service requirements of 5 to 150 psig. Gives operation features and specification data. Available with gas, oil, and combination gas/oil fuel system. — TEXSTEAM CORP.

**591—Steam Generators** — 18 sizes, from 20 to 600 bhp, for pressures to 250 psi, also for hot water. Complete details in Catalog 811F. — SUPERIOR COMBUSTION INDUSTRIES, INC.

### ENGINES—DRIVES POWER TRANSMISSION MATERIAL—HANDLING

**600—Mechanical Shaft Seals**—Chempro mechanical external seal described in Bulletin CP-551. First seal designed for complete interchangeability with packing. No mounting clamps, machinery stuffing box faces or drilling holes. Install in 30 min. Adjust after installation. — CHEMICAL & POWER PRODUCTS, INC.

**606—Retaining Ring Kits** — 400 Truarc cadmium plated rings — 84 sizes in one economy kit. Sizes from ¼ to 2½ in. in three most used series of internal, external and universal crescent ring designs — $34.50 per kit. — DIXIE BEARINGS, INC.

**607—Crane Systems** — Booklet 2008, profusely illustrated, shows how Tramrail transfer cranes can systematize handling; engineering and application data. — CLEVELAND TRAMRAIL DIV.

**610—Flexible Couplings** — All metal couplings described in Catalog 51A have no wearing parts; offer freedom from backlash, torsional rigidity; free end float; smooth continuous drive; and visual inspection in operation. — THOMAS FLEXIBLE COUPLING CO.

**614—Vertical Transportation** — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

**628—General Purpose Trucks** — Catalog T-54 describes two wheel hand trucks and platform — a full line manufactured in Rome, Ga. plant to cover your material handling needs. — THE FAIRBANKS CO.

**630—Mechanical Vibrating Conveyors** — Catalog 890 gives information on conveyability and density of typical solid materials and provides data on how to "Do It Yourself" to get required length. — JEFFREY MFG. CO.

**651—Bearing Aluminum Bars**—Aluminum bearings can replace bearings of other metals which cost twice as much. No sacrifice in performance or life. Catalog 46 covers composition, machining and use. — THE BUNTING BRASS AND BRONZE COMPANY.

**657—Bin Level Switches** — Bulletin 159 on "Tellevel" describes normal duty explosion proof and heavy duty units. — STEPHENS-ADAMSON MFG. CO.

### WATER TREATMENT—HEATING & AIR CONDITIONING—DUST & FUME CONTROL—REFRIGERATION

**700—Peak Load Problems?** — Keep your air conditioning and refrigeration systems operating at maximum efficiency during peak load months. Catalog tells how Anco treatment removes rust and scale and kills slime and algae in your equipment. — ANDERSON CHEMICAL COMPANY.

**715 — Amine Treatment** — Return line corrosion is a critical problem in maintaining economical, efficient power plant operation. Bulletin CP-100 shows how amine treatment is an easy, effective and economical way to eliminate pipe corrosion problems. — THE BIRD ARCHER COMPANY.

**719—No Frost Refrigeration** — Bulletin 105 describes with diagrams and photographs method used for food freezing, chilling and warehouse refrigeration on largest scale without frost or ice formation, insuring always full capacity and uniform temperature. — NIAGARA BLOWER CO.

**720—Power Roof Ventilator** — 4 page Bulletin 550 illustrates and describes company's Centrilator, the centrifugal power roof ventilator with the exclusive "jet siphon." Includes capacity and dimension tables. — CLARAGE FAN CO.

**723—Fly Ash Collection** — Catalog 103 tells you how "Double Eddy" goes to work to increase boiler fly ash collection. Buell Cyclones will not clog or plug even with loadings up to one pound of ash per cu ft of gas. — BUELL ENGINEERING COMPANY, INC.

**737—Water Treating Plan** — Separate bulletins combine in folder to form "A Complete Water Treating Plan" for boiler feedwater and cooling water treatment. Leaflets cover various aspects of treatment and equipment. — DEADY CHEMICAL COMPANY.

**748—Stop Fungal Decay** — Bulletin MT-58 describes company's preservative wood treatment for cooling towers, pinpoints organisms that destroy effective performance and prescribes treatment that arrests these destructive organisms, as well as the application techniques. — THE MARLEY COMPANY.

**751—Chemical Service** — Water-conditioning products, equipment and services highlighted in literature — boiler feedwater treatment, cooling water treatment, corrosion inhibitors, fuel oil additives, coagulants, cation resin cleaners, etc.—Chemical Service Dept., THE PERMUTIT COMPANY.

**774—Refrigerating Units** — Bulletin 97-F illustrates and describes low-pressure refrigerating units. — FRICK CO.

### ELECTRICAL

**802—Low-Peak Fuses** — New fuses that safely interrupt fault currents up to 200,000 amp described in Bulletin LPS. Protect mains, feeders, branch circuits, switches, etc. Limit fault current to very low values. Hold 500% load for minimum of ten seconds. Available in N.E.C. sizes from 15 to 600 amp in both 250 and 600 volt ranges. — BUSSMANN MFG. DIV.

**807—Motor Bearings** — Catalog 258 gives complete listing of cast bronze motor bearings for all makes and sizes. — THE BUNTING BRASS AND BRONZE COMPANY.

**816—High Voltage Protection** — 36 page catalog of linemen's protective equipment describes products for utility and industrial electrical fields. — CHARLESTON RUBBER COMPANY.

## KEEP UP-TO-DATE USE SPI READER SERVICE

**820—Electrical Maintenance** — New contract service (for Southeast only) inspects and tests motors, generators, gearing, control and distribution systems, at a cost less than 1% of value of equipment. — Atlanta Office of WESTINGHOUSE ELECTRIC.

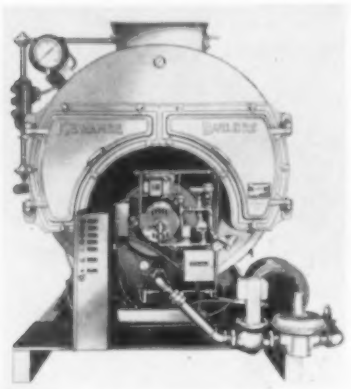
**860—Capacitors** — Correct power factor at the load. Bulletin PF-1150 describes self-contained capacitors in sizes from ½ to 15 kvar. No additional switches or fuses required. — SPRAGUE ELECTRIC COMPANY.

**894—Control Cable** — Bul. DM 5844 gives full technical data on thermoplastic all-purpose control cable with polyethylene insulation, double Densheath (PVC) jackets. — ANACONDA WIRE & CABLE CO.

# New Product Briefs (Continued)

## Forced-Draft Boilers

T-27 A new line of Kewanee Scotch Type packaged boilers for high and low pressure operation and featuring forced-draft firing is now available from **American-Standard Industrial Division**, Detroit 32, Michigan.



Certified output ratings for the new boilers are 83 to 691 hp for the low pressure units, and 82 to 672 hp for the high pressure units. Ratings are based on five square feet of ASME (fireside) heating surface per boiler horsepower. The low pressure packages are constructed in accordance with the ASME code for 15 psi steam or 30 psi water, and the high pressure packages for 125 or 150 psi steam. Higher pressures are available on special order. Forced-draft burners fire natural gas, all grades of fuel oil or combination gas/oil.

## Dust Control Systems

T-28 A new dust control system for use in small quarries and industrial power plants has been developed by **The Johnson-March Corp.**, Philadelphia, Pa. The new unit, called a Type G Chem-Jet Proportioner system, can achieve savings up to 33% for plants of limited capacity.

The proportioner is of particular significance to small plants where handling capacities do not exceed 150 tph and industrial power plants receiving up to 150 tons of coal per days or with coal handling capacities not exceeding 100 tph. Dust is controlled by applying a small amount of moisture at those points in the operation where dust is created. To produce the wetting action, a specially formulated surface active compound is utilized. This highly concentrated chemical solution is mixed by the Type G Proportioner with water in a ratio of one part solution (Compound MR-200) to 200 parts of water.

## Rust Preventive

T-29 **The Al-Con Chemical Company**, P. O. Box 8168, New Orleans 22, La., has announced production of a new corrosion preventive compound.

Known as Alconol 102-A, the product was developed to protect steel, tin plate, brass, aluminum, and other metals against corrosion for extended periods of time. It forms a thin but impervious film on the surface. The compound is economically priced so that it can be used to protect raw materials, parts in process, and finished items without affecting the operating or product cost.



*See Pages* 81 & 82

## Work Glove Automat

T-30 A unique glove dispenser has been designed by **Arlington Industries**, 1513 N. Shore Rd., Revere, Mass., to meet the problem of glove issue and control. Operating on special alloy tokens, it will dispense any type of work glove. It is adaptable to any existing program—free issue or sale at cost. Features include a sensitive slug rejector and non-reset counter. In combination these function honestly and efficiently, 24 hours a day, as automatic clerk, auditor and glove depot.

## Packaged Burner

T-31 **Coen Company**, 40 Boardman Place, San Francisco, combustion engineers and manufacturers, announce the new Model 60 Fyr-Compak packaged burner. This combination gas and oil burning unit is designed for packaged boilers in the 50,000 to 100,000-pounds-of-steam-per-hour size

ranges. Featuring high efficiencies over an unusually wide firing range, the Model 60 also incorporates many unique advantages over conventional burners, including special equipment to eliminate nuisance shutdowns.

## Steel Buildings

T-32 **Armco Drainage & Metal Products, Inc.**, one of the oldest and largest manufacturers of steel buildings, announces

a completely new line of pre-engineered steel buildings.

Clear-span widths range from 5'-4" up to 120 feet; sidewalls up to 40 feet. In addition, there is a whole new series of buildings with a single slope roof and in widths up to 24 feet.

A new choice of roof slopes is offered in the self-framing and rigid-frame buildings from 8 feet to 120 feet wide. Another feature is described as a "revolutionary roof structure" —a continuous beam-type purlin system in the roof of rigid-frame and truss-type buildings. Roof framework is lighter and more rigid. Purlins are above the rafters. Finishing is said to be faster, easier and more economical than the conventional roofing system.

## Insulating Spray

T-33 High resistance to oil, water, acids and alkalis for electrical equipment is reported for Sprayon No. 601 Red Insulating Varnish-Enamel according to the maker, **Industrial Supply Division, Sprayon Products, Inc.**, Cleveland, Ohio. Packed in self-spraying containers, the product is intended for use on new or old stator windings, armatures, coils, commutator end rings, frames and end shields, switchboard parts, bus bars and the like. It penetrates thoroughly and dries quickly to a tough, flexible film with high adhesion characteristics, high arc-resistance and non-tracking properties.

**For more Free Data FILL IN CODE NO. on the Handy Return Card — Page 81**

## Wire Rope Slings

T-34 Designated as Hi-Pli, a new series of preformed cable-laid slings have been introduced by the Wire Rope Sling Department, **American Chain & Cable Company, Inc.**, Wilkes-Barre, Pa. These wire rope slings, specifically designed for any application where ease of handling is all-important, offer the flexibility and non-kinking advantages of hemp rope plus the strength of steel.

Constructed from a combination of a specified number of individual preformed wire ropes, not strands, and laid around a steel center core, these slings are so flexible that knots can be tied into them without harm.

**PIGGY-BACK** pallet frames are used at Richmond Food Stores' new distribution warehouse to facilitate ceiling high stacking of such odd shaped items as brooms, mop handles, etc. The stack in the background is made up of sacks of dog food.

*Photo Courtesy the Raymond Corporation*

## Static Exciter

**A NEW** static-magnetic exciter system and voltage regulator developed for use in nuclear powered submarines were described by three General Electric Company engineers at a power generating symposium during the Summer General Meeting of the American Institute of Electrical Engineers. The units were the subject of a paper, "Performance of a New Static-Magnetic Exciter and Voltage Regulator for Wound Rotor Marine Steam Turbine Generators," by D. F. Talcott, W. Lynn, Mass., P. M. Tabor, Waynesboro, Va., and C. Concordia, Schenectady, N. Y.

They said that G-E also has built a similar excitation system for use with a 25,600 kva hydrogen cooled turbine generator, but data on its performance was not available at the time of writing.

The static exciter consists of a three-phase rectifier mounted in the generator air steam, three linear reactors and three saturable potential transformers mounted in the switchgear.

Because of the effects of magnetic saturation in the generator, changes in field resistance with temperature, and other minor variations, the exciter does not furnish exactly the required excitation under all loads and conditions. A voltage regulator is provided to adjust the exciter output by changing the direct current in the SCPI (saturable current potential transformer) control winding. The regulator also provides field forcing during load changes.

The exciter offers advantages of improved mechanical reliability over rotating exciters due to the elimination of all rotating parts, including commutators. Other advantages include reduction in length of the main unit compared to direct-connected exciters. Since it obtains power from its own generator, even under fault conditions, it offers advantages over motor-driven exciters or static systems which are dependent on an external source of power.

## Long Life for Heat Exchanger

**THE TEXAS CITY,** Tex., plant of Union Carbide Chemicals Co., has gotten 11 times the service life formerly obtainable from a vital heat exchanger by switching from copper tubes to stainless steel tubes.

The plant made the change in a vertical process condenser which handles a mixture of organic chemicals containing acetaldehyde, water and acetic acid.

Copper tubes, installed as original equipment, were no longer serviceable after approximately 18 months of operation. They were worn all over by general corrosion attack. The tube edges, in fact, were almost feather thin.

Then the company installed a bundle of 1,485 welded stainless tubes ¾" OD x 16 ga. x 12' long supplied by Carpenter Steel Co. This bundle, which is in process

around the clock, has been in operation 17 years.

None of the tubes have ever had to be cleaned on the process side. They have been cleaned on the shell or water side about once a year to remove scale.

Since the process temperature is considerably less than 100 C, the stainless tubes are not subject to water attack by stress corrosion cracking or otherwise. The cooling water flows at 40 C on the shell side.

## New Book
## Work Rules for Profit

**ONE OF THE MOST** common sources of industrial losses is found in obsolete work rules and practices. In many companies wasteful employee work practices are solely responsible for losses where there should be profits. Employee controlled productivity ranks a close second to obsolete work rules according to Ola C. Cool, veteran Director of the Labor Relations Institute.

There is a detailed list of wasteful work rules and practices in a new book by Mr. Cool, entitled — WORK RULES FOR PROFIT. Fourteen chapters of this up-to-date book are devoted to discussions of such practical industrial problems as: "Featherbedding"; Wasteful Work Rules; Waste Elimination; Changes in Work Rules and Group Controls of Productivity. Methods by which wasteful work rules may be identified and employee controls eliminated are also pointed out.

Such important subjects as Employee Discipline and a Penalty Code, Effective Supervision and Employee Training are also thoroughly discussed. The final three chapters of this important volume include a complete analysis of Management Prerogatives in Union Contracts, Work Schedules and Arbitration together with recommended clauses.

This new book is documented with references to decisions of Federal and State Courts together with rulings of arbitrators on these important issues.

The author of this new volume is Ola C. Cool, Institute Director and also former acting Chairman of the Industrial Problems Committee of the New York Chamber of Commerce.

Copies of WORK RULES FOR PROFIT may be obtained for $5.00 each, postage prepaid, directly from the LABOR RELATIONS INSTITUTE, P. O. BOX 306, Millington, N. J.

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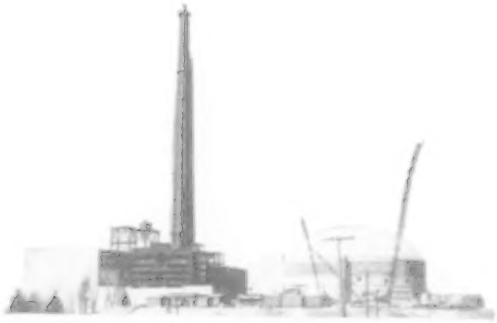

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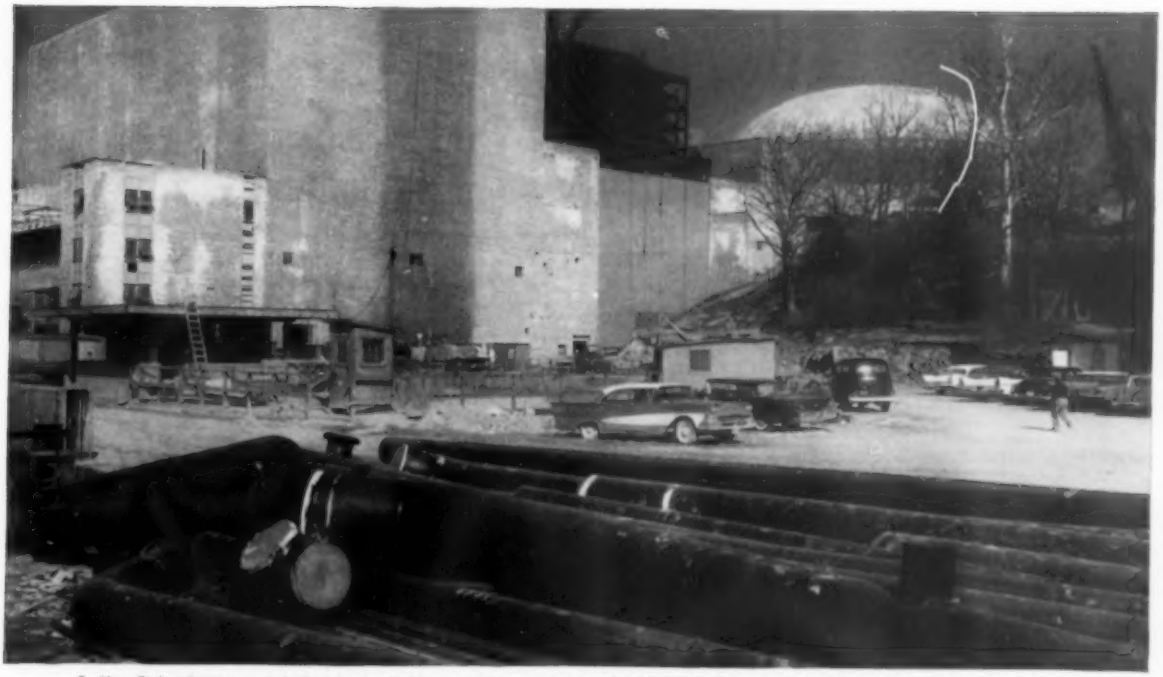

*Indian Point Station as it looked in April this year, showing some of the piping to be installed by Kellogg's Power Piping Division*

## NUCLEAR POWER PIPING BY KELLOGG

Construction progress at Consolidated Edison Company's Indian Point Station demonstrates how Kellogg's broad erection experience can take tomorrow's newest and toughest power piping requirements in stride.

At this unique 275 Mw nuclear steam electric generating station, Kellogg has a contract to manufacture, deliver, and to erect all stainless and carbon steel nuclear piping for the inside of the reactor sphere, and all power piping for the conventional portion of this plant. Kellogg also stress-analyzed the major portion of this piping. Much of the stainless piping will be manufactured in Kellogg's Williamsport plant.

The particularly rigid specifications of high quality and close tolerances required the assignment of a special engineering staff to the site. This staff plans, coordinates and supervises each step of Kellogg's erection assignment. One important phase entails over 2200 critical welds, most utilizing Kellogg's K-Weld technique. Another is the radiographic inspection of each weld, which Kellogg is undertaking with its own equipment and personnel.

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Kellogg welcomes inquiries for its stress analysis, metallurgical, engineering, manufacturing and erection services.

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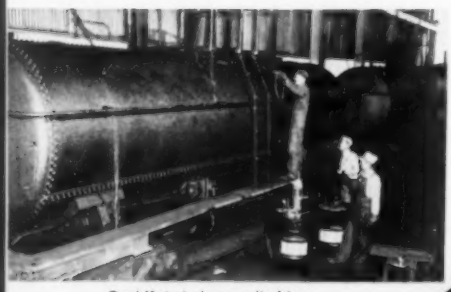
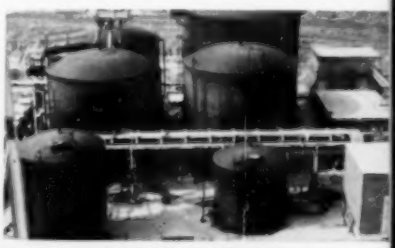


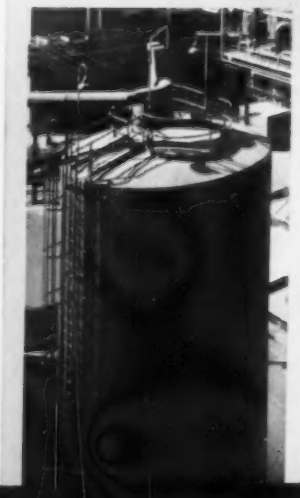
Seal Kote being applied to liquid chemical tank cars.



Seal Kote and K Kote on conveyors, pipe, tanks.



Seal Kote on Horton Spheres to prevent corrosion.



K Kote on soap and black liquor tanks at pulp mill.

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